26CA0004594HJF1

[redacted]

U.S. Environmental Protection Agency (EPA) Region IX
Superfund Enforcement Branch
Enforcement Response Section

Field Sampling Plan

for
Field Analytical Services Program
Subsurface Soil Sampling

near

Montrose Chemical Superfund Site
Torrance, Los Angeles County, California

Site CERCLIS Number: CAD008242711

Anticipated Sampling Dates: June 27 through July 8, 1994

Prepared by
Environmental Services Assistance Team (ESAT)
ICF Kaiser International, Inc.
160 Spear Street, Suite 1380
San Francisco, California 94105-1535

Document Control Number
ESAT-QA-9A-10016

June 17, 1994

Prepared for
EPA Remedial Project Manager
Nancy Woo
(415) 744-2404

For EPA use:

Received by Site Assessment Manager: _____ Date: _____
Reviewed by: _____ Date: _____
Status: ☐ Approved ☐ Not Approved

Expedited Review? ☐ Yes ☐ No
Received by QA Management Section: Date: 6/20/94
Reviewed by: _____ Date: _____
Status: ☐ Approved ☐ Not Approved

Concurrence: _____ Date: _____

Chief, Quality Assurance
Management Section
Environmental Services Branch, OPM

APPENDICES (continued)

LIST OF FIGURES

LIST OF TABLES

APPENDICES (continued)

LIST OF FIGURES

LIST OF TABLES

1.0 OBJECTIVES

The Environmental Services Assistance Team (ESAT) will conduct subsurface soil sampling near the Montrose Chemical Superfund Site in the City of Torrance, Los Angeles County, California, to fulfill the following objectives: (1) to determine the extent of fill material by bore hole logging and particle size tests, and (2) to determine the distribution of dichlorodiphenyltrichloroethane (DDT) isomers and degradation products throughout the study area by immunoassay field testing by the Field Analytical Services Program (FASP) and (3) to obtain fixed laboratory confirmation of the immunoassay results and additional fixed laboratory analyses of volatile organics. Results of these analyses and information gathered during this investigation will be provided to the U.S. Environmental Protection Agency (EPA) and will supplement data gathered during soil investigations in 1983 by the California Department of Health Services; in September 1993, by Dames and Moore; in February 1994, by CH2M HILL; and in March 1994, by Ecology and Environment. Sample data will be used by the EPA to evaluate the need for further investigation or remediation at the site.

This field sampling plan was prepared based on guidance provided in "Preparation of a U.S EPA Region IX Sample Plan for EPA-Lead Superfund Projects" (Quality Assurance Management Section (QAMS), U.S. EPA, Region IX, August, 1993, Document Control Number 9QA-05-93) and information provided in the documents; "Focused Sampling and Analysis Plan, Surface Soil Sampling Program, Site-Adjacent Residential Area, Del Amo Study Area, Los Angeles, California," prepared by Dames and Moore and dated August 16, 1993; and "Air Surveillance Plan, Montrose Backyards, Torrance, California," prepared by Ecology and Environment and dated April, 1994; and in memoranda from CH2M HILL to EPA titled, "Report on Del Amo Backyard Soil Sampling," dated March 7, 1994; and "Report on Backyard Soil Sampling Results," dated March 15, 1994.

2.0 BACKGROUND

2.1 Site Location and Description

The study area is located adjacent to the Del Amo Superfund site between Del Amo Boulevard and 204th Street, and between the northern extensions of Budlong and Berendo Avenues in the City of Torrance, Los Angeles County, California (Figure 2-1). The Montrose Chemical Superfund site is located at the junction of Del Amo Boulevard and Normandie Avenue, approximately 1500 feet from the study area. The study area covers approximately 2.3 acres and consists primarily of residential properties and undeveloped public lands. The perimeter of the study area consists of residential properties, concrete sidewalks and asphalt that extend along the length of 204th Street, and pavement and undeveloped lands that extend along the length of Del Amo Boulevard.

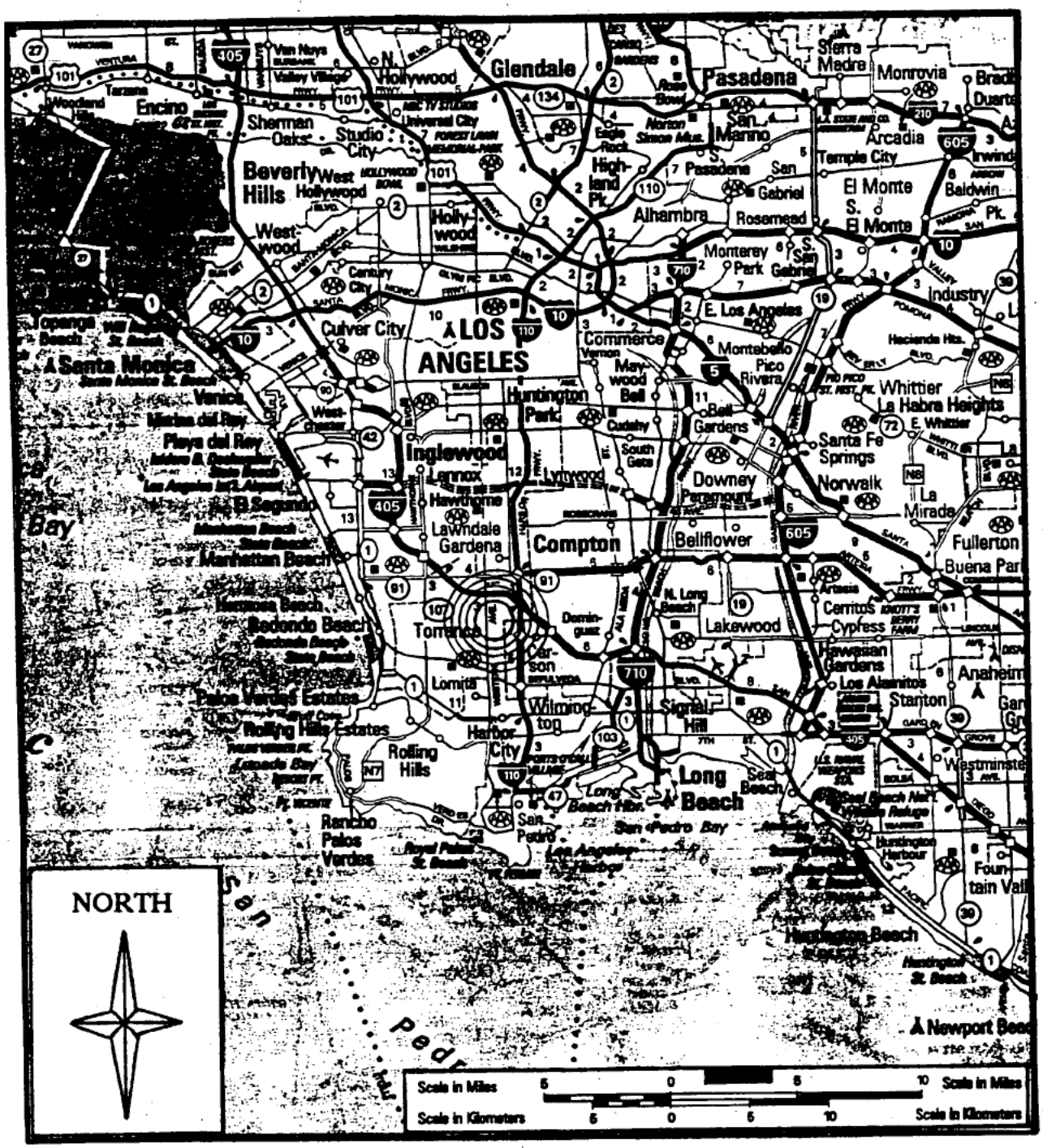


Figure 2-1 Site location map.

2.2 Site History

According to aerial photographs, the study area consisted of a natural drainage that flowed in a southerly direction. This drainage was filled between 1953 and 1956, and structures were built over the fill material between 1956 and 1972.

Previous soil investigations in the study area indicated elevated levels of DDT isomers and degradation products in the backyards of residences overlying the fill area. The CH2M HILL February investigation indicated that DDT concentrations ranged from 231 to 606 parts per million (ppm) in three 20 ft. by 20 ft. grid squares out of a total of 36 grid squares. Samples from the remaining grid squares exhibited DDT concentrations ranging from 0.1 to 45.3 ppm. Samples containing these concentrations were collected at a depth of six inches. Eight samples collected by Ecology and Environment from 1, 2, and 3 foot depths during the March investigation were found to contain DDT concentrations which ranged from 0.01 to 2880 ppm, and total DDT concentrations of 4509 ppm which included the 2,4'- and 4,4'-DDT isomers and the DDT degradation products 2,4'-, and 4, 4'-dichlorodiphenyldichloroethane (DDD), 2,4'- and 4,4-dichlorophenyldichloroethylene (DDE).

Soils have been excavated down to seven feet over portions of the backyard areas of 1051 and 1055 204th Street since the March investigation. In addition, according to EPA records, previous investigations identified elevated levels of chlorobenzene in the backyards of residences overlying the fill area.

3.0 RATIONALE FOR SAMPLING LOCATIONS, NUMBER OF SAMPLES, AND ANALYTICAL PARAMETERS

The sampling and analysis strategy which will be applied to the study were developed to satisfy two initial field objectives: (1) to determine the horizontal and vertical extent of fill material by bore hole logging and particle size tests, and (2) to determine the distribution of DDT throughout the study area by immunoassay field testing by FASP. Samples from these locations will be selected for offsite fast turnaround laboratory analyses based on the immunoassay results. The details of the immunoassay testing and strategy for fixed laboratory analyses are discussed in detail in Section 4.0. The western and eastern portions of the study area are illustrated on Figures 3-1 and 3-2, respectively.

Sufficient soil samples will be collected to determine the vertical and horizontal boundaries of the fill material and the maximum depth of the fill. Initial sampling will focus on the suspected fill borders based on the aerial photographs. The fill material and native soil will be identified through visual inspection of the soil cores. At a minimum, a sample from each side of the fill-native soil border will be collected. Samples will be selected perpendicular to the suspected fill line at 25 foot intervals until a sample containing only native soil is obtained. The horizontal fill border will be designated as the halfway point between those two samples. The vertical fill profile along the border will be obtained by collecting samples at three foot intervals until native soil is collected. Once definition of the fill border is completed, a sampling transect will be made across the longest horizontal distance between the borders of the fill. Again, samples will be taken at 25 foot horizontal distance along the sampling line and at three foot vertical intervals at each sampling location until native soil is obtained. From this information, the three dimensional geometry of the fill will be estimated. The sample locations identified in the front yards of the houses on 204th Street will be included within this sampling strategy.

In Figure 3-3, the strategy for fill definition is presented pictorially for the following scenario:

EXAMPLE SCENARIO

Sample A is taken on the inside boundary of the historically reported fill line, and it is determined, through visual inspection, that the fill extends to seven feet below ground surface. A second sample (Sample B) is taken approximately 25 feet away, toward, and perpendicular to the expected fill line. Fill is detected in this sample at a depth of four feet. A third sample (Sample C) is selected at a horizontal distance of 25 feet from Sample B, and it is determined to be native soil. By this method, the fill border is estimated to be halfway between the last sample in which the fill material is identified, Sample B, and the first sample, Sample C, in which only native soil is found.

The next sampling location (Sample D) will be selected at a distance of 25 feet from the sample in which only native soil was found, in a direction parallel to Del Amo Boulevard. If this sample contains fill, the process previous described will be repeated. If the sample contains native soil, the process will be repeated but in the opposite direction.

Once the boundary of the fill has been established, a sampling line will be drawn through the longest distance between fill borders and samples will be taken at a horizontal distance of 25 feet and at three foot vertical intervals. The depth of the fill will be determined at each sampling location (Figure 3-4).

Figure 3-3: Sampling Strategy for Horizontal Border Definition

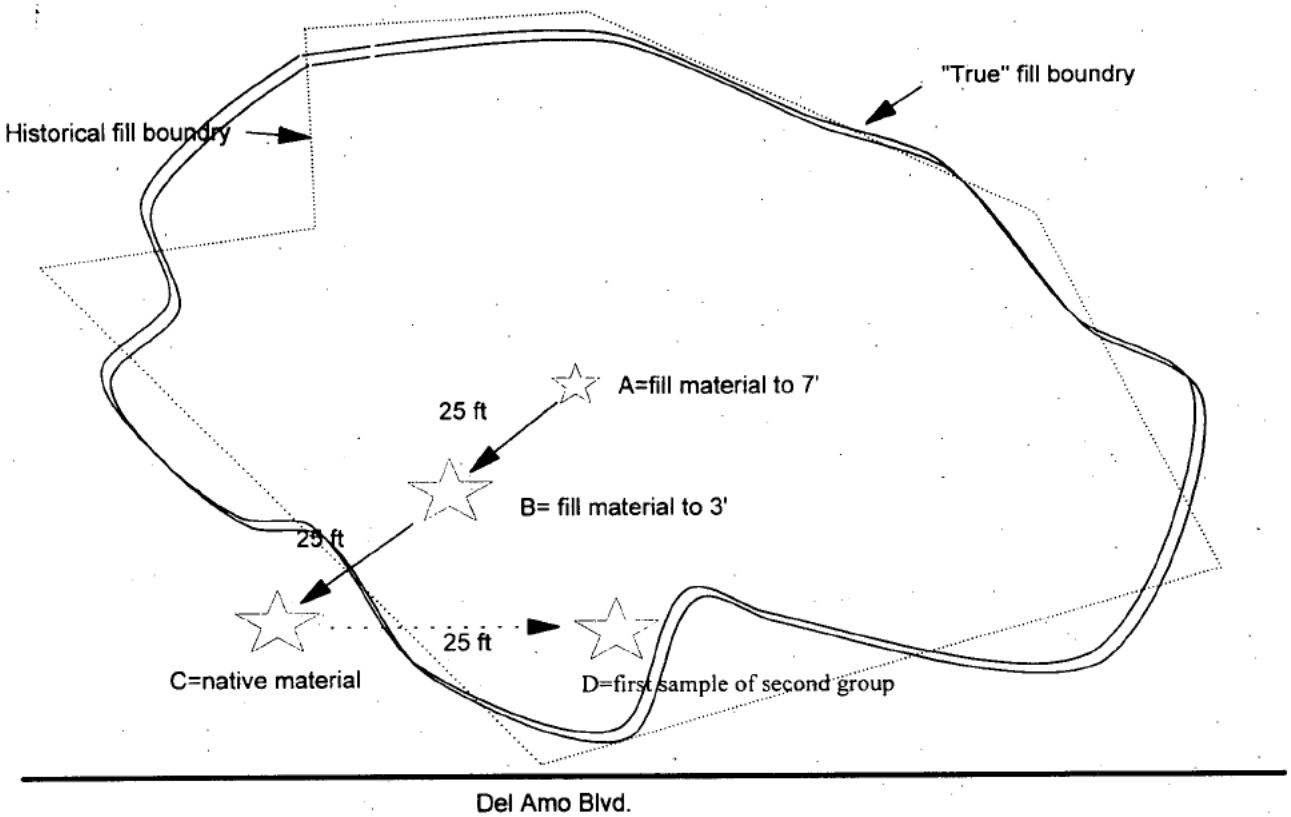


Figure 3-3 Sampling strategy for horizontal border definition.

Figure 3-4: Sampling Strategy for Vertical Fill Definition

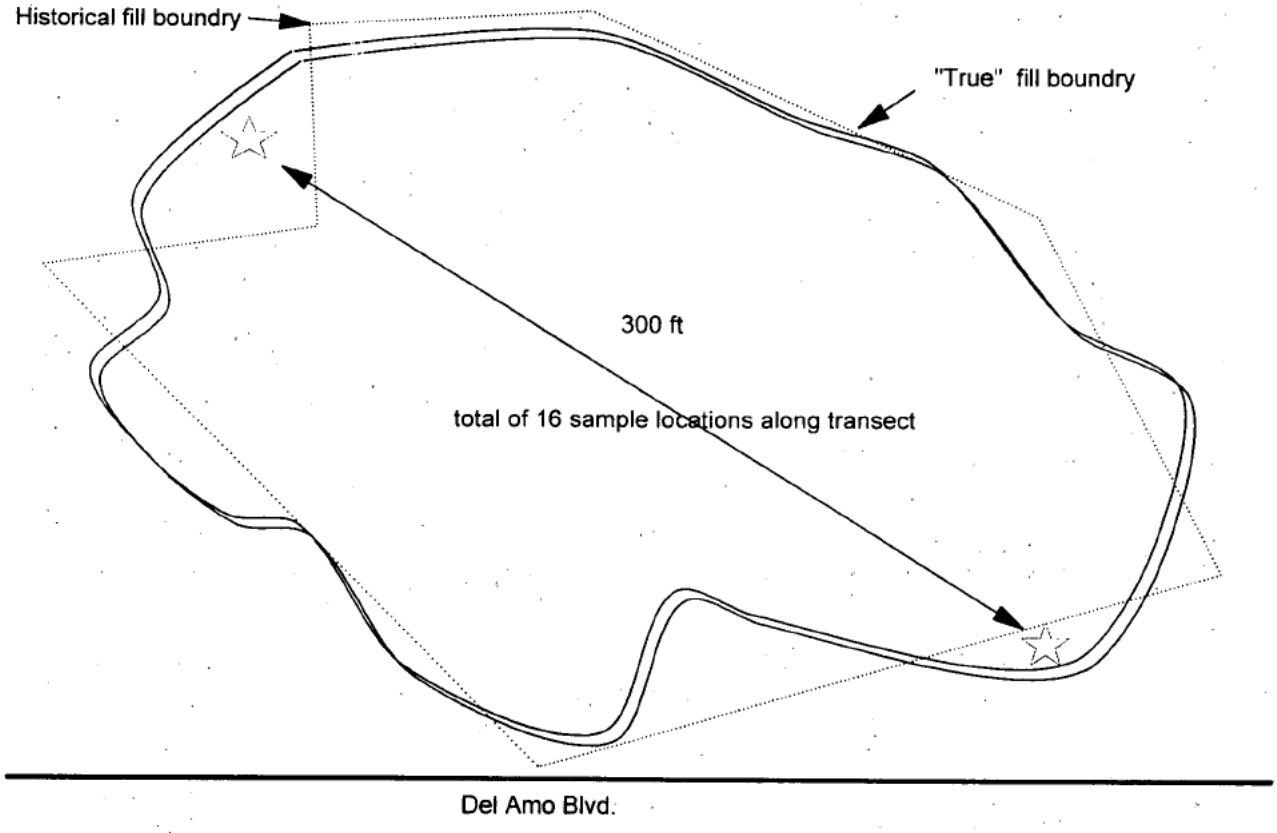


Figure 3-4 Sampling strategy for vertical fill definition.

The total number of samples which will be taken cannot be exactly estimated since the number of samples required to define the horizontal and vertical fill boundaries cannot be determined prior to the start of the investigation and there will likely be physical impediments to some sample locations proposed by this plan. For planning purposes only, the following assumptions are made:

- Five individual sample locations will be required to define each horizontal fill boundary position,
- At each sampling location two samples will be sent for offside laboratory analysis,
- The perimeter distance of the historical fill boundary is 1000 feet and is equal to the perimeter distance around the "true" fill boundary,
- Del Amo Boulevard is the northern border and 204th street is the southern border of the fill material,
- The samples collected in the front yards of the residences along 204th Street will contain no fill material.

Based on these assumptions, there may be as many as forty sampling locations, 160 soil samples collected to perform the fill definition and immunoassay testing, and 80 samples collected for fixed laboratory analyses. The total number of samples include the sampling locations in the front yards of the houses and in planter boxes and soil areas along the sidewalk of the north side of 204th street. Samples will also be collected in the front yards of residences and in planter boxes and soil areas along the sidewalk of the south side of 204th Street. Bore holes will not be drilled through the concrete sidewalk nor the asphalt of 204th Street.

The widest transect distance across the historical fill boundary is approximately 300 feet. Therefore, to determine the vertical distribution of fill material, a total of sixteen sample locations at 25 foot intervals will be required. Four samples will be collected at each location for immunoassay tests and, based on the above assumptions, two samples will be collected for off site analyses. The determination of the final number of samples for fixed laboratory analyses will be based on the discussion in Section 5.0. The visual determination of the presence of fill material and native material will be confirmed by particle size analyses on selected samples.

If it is determined that the assumptions above are not supported by either the visual inspection of the soil cores or the chemical testing, or if insurmountable physical impediments prevent implementation of this sampling strategy, the FASP Task Monitor, Stewart Simpson, will be contacted immediately for further direction.

Duplicate samples will be collected at a frequency of one per ten samples. One background sample will be collected at a location approximately 2 miles south of the study area, which is consistent with the background sample location of the September, 1993, Dames and Moore investigation. One equipment rinsate sample will be collected per day

for each sampling method. One per twenty samples will be designated as laboratory quality control (QC) samples. The equipment rinsate blanks will be analyzed for all parameters at a off site laboratory.

Split samples will be provided to community members, property owners, and the potentially responsible party's (PRP's) contractors as necessary. Due to the two foot length of each Geoprobe sampling tube, and the planned distribution of consecutive subsamples within each two foot sample tube, there may not be enough soil per sample tube for split sample distribution. Every effort will be made to provide split samples, and additional samples will be provided from holes drilled within a one foot radius of each sample location, as necessary.

4.0 REQUEST FOR ANALYSES

Sampling is anticipated to begin June 27, 1994. All samples collected as part of this investigation will be analyzed by using immunoassay techniques for DDT isomers and degradation. A subset of samples will be analyzed for semivolatile (SVOCs) and volatile compounds (VOCs) by an off site laboratory. The samples will be analyzed for the EPA Contract Laboratory Program (CLP) Statement of Work (SOW) volatile target compound list analytes and semivolatile Target Compound List analytes with the addition of the DDT isomers, DDT degradation products, and the hexachlorocyclohexane isomers (α-BHC, β-BHC, γ-BHC). Samples which are determined to contain less than 0.5 ppm of total DDT will be analyzed by EPA CLP SOW procedures for target analyte list pesticides and polychlorinatedbiphenyls (PCBs) by gas chromatography with electron capture detection. Quality control, precision, and accuracy limits, and corrective actions for analyses to be performed at a CLP laboratory are listed in Appendix A.

The immunoassay testing will be conducted according to FASP SOP F93025 contained in Appendix B. Calibration of the testing apparatus is accomplished using prepackaged calibration samples which correspond to 0.2, 1, and 10 ppm of total DDT. The effective calibration range will be adjusted by dilution of sample extracts. A 1:2.5 dilution will be used for this project so that an effective calibration range of 0.5, 2.5, and 25 ppm of total DDT is obtained. Each soil sample will be analyzed and the resulting concentration will be used to select samples for offside analyses according to the following flow chart:

Step 1.)

Analyze each sample extract at a 1:2.5 dilution to obtain an effective calibration range of 0.5 to 25 ppm total DDT

Step 2.)

immunoassay result ≥ 25 ppm; Submit 100% of samples for fixed laboratory analysis for VOA and SVOC analyses

Step 3.)

25 ppm ≥ immunoassay result ≥ 0.5 ppm; Submit 20% of samples for fixed laboratory analysis for VOC and SVOC analyses

Step 4.)

0.5 ppm ≥ immunoassay result; Submit 20% of samples for fixed laboratory analysis for VOC, SVOC, and pesticide analyses

All samples which are determined to have a total DDT concentration greater than 25 ppm, and 20% of samples determined to have a total DDT concentration between 0.5 and 25 ppm by immunoassay screening will be submitted to the Region 9 laboratory for semivolatile and volatile organic analyses following CLP SOW procedures. The semivolatile target list will include all the DDT isomers, DDT degradation products, and the BHC isomers. Twenty percent of the samples which yield immunoassay results within the calibration range which are below 0.5 ppm will be submitted for CLP SOW pesticide and PCB analysis in addition to analysis of volatile and semivolatile compounds. The TCL list for all compounds with established method detection limits is contained in Appendix C. Sample numbers, station location numbers, required sample containers, analyses requested, sample preservatives, and contract and analytical holding times are listed in Tables 4-1, 4-2, and 4-3, Request for Analyses.

TABLE 4-1 REQUEST FOR ANALYSIS
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 1-1	S 1	06/27/94	LOW/MED	4	1	1	1
S 1-2 LAB QC SAMPLE	S 1	06/27/94	LOW/MED	4	2	2	2
S 1-3	S 1	06/27/94	LOW/MED	4	1	1	1
S 1-4	S 1	06/27/94	LOW/MED	4	1	1	1
S 2-1	S 2	06/27/94	LOW/MED	4	1	1	1
S 2-2	S 2	06/27/94	LOW/MED	4	1	1	1
S 2-3	S 2	06/27/94	LOW/MED	4	1	1	1
S 2-4	S 2	06/27/94	LOW/MED	4	1	1	1
S 3-1	S 3	06/27/94	LOW/MED	4	1	1	1
S 3-2	S 3	06/27/94	LOW/MED	4	1	1	1
S 3-3	S 3	06/27/94	LOW/MED	4	1	1	1
S 3-4	S 3	06/27/94	LOW/MED	4	1	1	1
S 4-1	S 4	06/27/94	LOW/MED	4	1	1	1
S 4-2	S 4	06/27/94	LOW/MED	4	1	1	1
S 4-3	S 4	06/27/94	LOW/MED	4	1	1	1
S 4-4	S 4	06/27/94	LOW/MED	4	1	1	1
S 5-1	S 5	06/27/94	LOW/MED	4	1	1	1
S 5-2	S 5	06/27/94	LOW/MED	4	1	1	1
S 5-3	S 5	06/27/94	LOW/MED	4	1	1	1
S 5-4	S 5	06/27/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 6-1	S 6	06/28/94	LOW/MED	4	1	1	1
S 6-2 LAB QC SAMPLE	S 6	06/28/94	LOW/MED	4	2	2	2
S 6-3	S 6	06/28/94	LOW/MED	4	1	1	1
S 6-4	S 6	06/28/94	LOW/MED	4	1	1	1
S 7-1	S 7	06/28/94	LOW/MED	4	1	1	1
S 7-2	S 7	06/28/94	LOW/MED	4	1	1	1
S 7-3	S 7	06/28/94	LOW/MED	4	1	1	1
S 7-4	S 7	06/28/94	LOW/MED	4	1	1	1
S 8-1	S 8	06/28/94	LOW/MED	4	1	1	1
S 8-2	S 8	06/28/94	LOW/MED	4	1	1	1
S 8-3	S 8	06/28/94	LOW/MED	4	1	1	1
S 8-4	S 8	06/28/94	LOW/MED	4	1	1	1
S 9-1	S 9	06/28/94	LOW/MED	4	1	1	1
S 9-2	S 9	06/28/94	LOW/MED	4	1	1	1
S 9-3	S 9	06/28/94	LOW/MED	4	1	1	1
S 9-4	S 9	06/28/94	LOW/MED	4	1	1	1
S 10-1	S 10	06/28/94	LOW/MED	4	1	1	1
S 10-2	S 10	06/28/94	LOW/MED	4	1	1	1
S 10-3	S 10	06/28/94	LOW/MED	4	1	1	1
S 10-4	S 10	06/28/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCENTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 11-1	S 11	06/29/94	LOW/MED	4	1	1	1
S 11-2 LAB QC SAMPLE	S 11	06/29/94	LOW/MED	4	2	2	2
S 11-3	S 11	06/29/94	LOW/MED	4	1	1	1
S 11-4	S 11	06/29/94	LOW/MED	4	1	1	1
S 12-1	S 12	06/29/94	LOW/MED	4	1	1	1
S 12-2	S 12	06/29/94	LOW/MED	4	1	1	1
S 12-3	S 12	06/29/94	LOW/MED	4	1	1	1
S 12-4	S 12	06/29/94	LOW/MED	4	1	1	1
S 13-1	S 13	06/29/94	LOW/MED	4	1	1	1
S 13-2	S 13	06/29/94	LOW/MED	4	1	1	1
S 13-3	S 13	06/29/94	LOW/MED	4	1	1	1
S 13-4	S 13	06/29/94	LOW/MED	4	1	1	1
S 14-1	S 14	06/29/94	LOW/MED	4	1	1	1
S 14-2	S 14	06/29/94	LOW/MED	4	1	1	1
S 14-3	S 14	06/29/94	LOW/MED	4	1	1	1
S 14-4	S 14	06/29/94	LOW/MED	4	1	1	1
S 15-1	S 15	06/29/94	LOW/MED	4	1	1	1
S 15-2	S 15	06/29/94	LOW/MED	4	1	1	1
S 15-3	S 15	06/29/94	LOW/MED	4	1	1	1
S 15-4	S 15	06/29/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCENTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 16-1	S 16	07/01/94	LOW/MED	4	1	1	1
S 16-2 LAB QC SAMPLE	S 16	07/01/94	LOW/MED	4	2	2	2
S 16-3	S 16	07/01/94	LOW/MED	4	1	1	1
S 16-4	S 16	07/01/94	LOW/MED	4	1	1	1
S 17-1	S 17	07/01/94	LOW/MED	4	1	1	1
S 17-2	S 17	07/01/94	LOW/MED	4	1	1	1
S 17-3	S 17	07/01/94	LOW/MED	4	1	1	1
S 17-4	S 17	07/01/94	LOW/MED	4	1	1	1
S 18-1	S 18	07/01/94	LOW/MED	4	1	1	1
S 18-2	S 18	07/01/94	LOW/MED	4	1	1	1
S 18-3	S 18	07/01/94	LOW/MED	4	1	1	1
S 18-4	S 18	07/01/94	LOW/MED	4	1	1	1
S 19-1	S 19	07/01/94	LOW/MED	4	1	1	1
S 19-2	S 19	07/01/94	LOW/MED	4	1	1	1
S 19-3	S 19	07/01/94	LOW/MED	4	1	1	1
S 19-4	S 19	07/01/94	LOW/MED	4	1	1	1
S 20-1	S 20	07/01/94	LOW/MED	4	1	1	1
S 20-2	S 20	07/01/94	LOW/MED	4	1	1	1
S 20-3	S 20	07/01/94	LOW/MED	4	1	1	1
S 20-4	S 20	07/01/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 21-1	S 21	07/05/94	LOW/MED	4	1	1	1
S 21-2 LAB QC SAMPLE	S 21	07/05/94	LOW/MED	4	2	2	2
S 21-3	S 21	07/05/94	LOW/MED	4	1	1	1
S 21-4	S 21	07/05/94	LOW/MED	4	1	1	1
S 22-1	S 22	07/05/94	LOW/MED	4	1	1	1
S 22-2	S 22	07/05/94	LOW/MED	4	1	1	1
S 22-3	S 22	07/05/94	LOW/MED	4	1	1	1
S 22-4	S 22	07/05/94	LOW/MED	4	1	1	1
S 23-1	S 23	07/05/94	LOW/MED	4	1	1	1
S 23-2	S 23	07/05/94	LOW/MED	4	1	1	1
S 23-3	S 23	07/05/94	LOW/MED	4	1	1	1
S 23-4	S 23	07/05/94	LOW/MED	4	1	1	1
S 24-1	S 24	07/05/94	LOW/MED	4	1	1	1
S 24-2	S 24	07/05/94	LOW/MED	4	1	1	1
S 24-3	S 24	07/05/94	LOW/MED	4	1	1	1
S 24-4	S 24	07/05/94	LOW/MED	4	1	1	1
S 25-1	S 25	07/05/94	LOW/MED	4	1	1	1
S 25-2	S 25	07/05/94	LOW/MED	4	1	1	1
S 25-3	S 25	07/05/94	LOW/MED	4	1	1	1
S 25-4	S 25	07/05/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 26-1	S 26	07/06/94	LOW/MED	4	1	1	1
S 26-2 LAB QC SAMPLE	S 26	07/06/94	LOW/MED	4	2	2	2
S 26-3	S 26	07/06/94	LOW/MED	4	1	1	1
S 26-4	S 26	07/06/94	LOW/MED	4	1	1	1
S 27-1	S 27	07/06/94	LOW/MED	4	1	1	1
S 27-2	S 27	07/06/94	LOW/MED	4	1	1	1
S 27-3	S 27	07/06/94	LOW/MED	4	1	1	1
S 27-4	S 27	07/06/94	LOW/MED	4	1	1	1
S 28-1	S 28	07/06/94	LOW/MED	4	1	1	1
S 28-2	S 28	07/06/94	LOW/MED	4	1	1	1
S 28-3	S 28	07/06/94	LOW/MED	4	1	1	1
S 28-4	S 28	07/06/94	LOW/MED	4	1	1	1
S 29-1	S 29	07/06/94	LOW/MED	4	1	1	1
S 29-2	S 29	07/06/94	LOW/MED	4	1	1	1
S 29-3	S 29	07/06/94	LOW/MED	4	1	1	1
S 29-4	S 29	07/06/94	LOW/MED	4	1	1	1
S 30-1	S 30	07/06/94	LOW/MED	4	1	1	1
S 30-2	S 30	07/06/94	LOW/MED	4	1	1	1
S 30-3	S 30	07/06/94	LOW/MED	4	1	1	1
S 30-4	S 30	07/06/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 31-1	S 31	07/07/94	LOW/MED	4	1	1	1
S 31-2 LAB QC SAMPLE	S 31	07/07/94	LOW/MED	4	2	2	2
S 31-3	S 31	07/07/94	LOW/MED	4	1	1	1
S 31-4	S 31	07/07/94	LOW/MED	4	1	1	1
S 32-1	S 32	07/07/94	LOW/MED	4	1	1	1
S 32-2	S 32	07/07/94	LOW/MED	4	1	1	1
S 32-3	S 32	07/07/94	LOW/MED	4	1	1	1
S 32-4	S 32	07/07/94	LOW/MED	4	1	1	1
S 33-1	S 33	07/07/94	LOW/MED	4	1	1	1
S 33-2	S 33	07/07/94	LOW/MED	4	1	1	1
S 33-3	S 33	07/07/94	LOW/MED	4	1	1	1
S 33-4	S 33	07/07/94	LOW/MED	4	1	1	1
S 34-1	S 34	07/07/94	LOW/MED	4	1	1	1
S 34-2	S 34	07/07/94	LOW/MED	4	1	1	1
S 34-3	S 34	07/07/94	LOW/MED	4	1	1	1
S 34-4	S 34	07/07/94	LOW/MED	4	1	1	1
S 35-1	S 35	07/07/94	LOW/MED	4	1	1	1
S 35-2	S 35	07/07/94	LOW/MED	4	1	1	1
S 35-3	S 35	07/07/94	LOW/MED	4	1	1	1
S 35-4	S 35	07/07/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-1 REQUEST FOR ANALYSIS (continued)
SAMPLE MATRIX: SOIL

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES
S 36-1	S 36	07/08/94	LOW/MED	4	1	1	1
S 36-2 LAB QC SAMPLE	S 36	07/08/94	LOW/MED	4	2	2	2
S 36-3	S 36	07/08/94	LOW/MED	4	1	1	1
S 36-4	S 36	07/08/94	LOW/MED	4	1	1	1
S 37-1	S 37	07/08/94	LOW/MED	4	1	1	1
S 37-2	S 37	07/08/94	LOW/MED	4	1	1	1
S 37-3	S 37	07/08/94	LOW/MED	4	1	1	1
S 37-4	S 37	07/08/94	LOW/MED	4	1	1	1
S 38-1	S 38	07/08/94	LOW/MED	4	1	1	1
S 38-2	S 38	07/08/94	LOW/MED	4	1	1	1
S 38-3	S 38	07/08/94	LOW/MED	4	1	1	1
S 38-4	S 38	07/08/94	LOW/MED	4	1	1	1
S 39-1	S 39	07/08/94	LOW/MED	4	1	1	1
S 39-2	S 39	07/08/94	LOW/MED	4	1	1	1
S 39-3	S 39	07/08/94	LOW/MED	4	1	1	1
S 39-4	S 39	07/08/94	LOW/MED	4	1	1	1
S 40-1	S 40	07/08/94	LOW/MED	4	1	1	1
S 40-2	S 40	07/08/94	LOW/MED	4	1	1	1
S 40-3	S 40	07/08/94	LOW/MED	4	1	1	1
S 40-4	S 40	07/08/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				80	21	21	21
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-2 REQUEST FOR ANALYSIS
SAMPLE MATRIX: SOIL DUPLICATES

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	14 DAYS	14 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	10 DAYS	10 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR	1 x 8 OZ WIDE MOUTH GLASS JAR
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF [illegible]	NUMBER OF SAMPLES
X 1-1	X 1	06/27/94	LOW/MED	4	1	1	1
X 2-1	X 2	06/27/94	LOW/MED	4	1	1	1
X 3-1	X 3	06/28/94	LOW/MED	4	1	1	1
X 4-1	X 4	06/28/94	LOW/MED	4	1	1	1
X 5-1	X 5	06/29/94	LOW/MED	4	1	1	1
X 6-1	X 6	06/29/94	LOW/MED	4	1	1	1
X 7-1	X 7	06/30/94	LOW/MED	4	1	1	1
X 8-1	X 8	06/30/94	LOW/MED	4	1	1	1
X 9-1	X 9	07/01/94	LOW/MED	4	1	1	1
X 10-1	X 10	07/01/94	LOW/MED	4	1	1	1
X 11-1	X 11	07/05/94	LOW/MED	4	1	1	1
X 12-1	X 12	07/05/94	LOW/MED	4	1	1	1
X 13-1	X 13	07/06/94	LOW/MED	4	1	1	1
X 14-1	X 14	07/06/94	LOW/MED	4	1	1	1
X 15-1	X 15	07/07/94	LOW/MED	4	1	1	1
X 16-1	X 16	07/07/94	LOW/MED	4	1	1	1
TOTAL LOW CONCENTRATION				64	16	16	16
TOTAL MEDIUM COMCEMTRATION							

TABLE 4-3 REQUEST FOR ANALYSIS
SAMPLE MATRIX: EQUIPMENT RINSATE BLANKS

ANALYSIS REQUESTED				ORGANICS	ORGANICS	ORGANICS	ORGANICS
SPECIFIC ANALYES REQUESTED				IMMUNOASSAY PESTICIDES	TCL VOAS	TCL SEMIVOLATILES + DDT, DDE DDD	TCL PESTICIDES/PCBs
PRESEVATIVES				N/A	1:1 HCl to pH < 2 & CHILL 4 DEG C	CHILL 4 DEG C	CHILL 4 DEG C
ANALYTICAL HOLDING TIME				N/A	14 DAYS	7 DAYS	7 DAYS
CONTRACT HOLDING TIME				N/A	10 DAYS	5 DAYS	5 DAYS
NO. SAMPLE x SAMPLE BOTTLE TYPE				N/A	3 X 40 mL VOA VIALS	1 x 1 L AMBER GLASS BOTTLE	
SAMPLE IDENTIFICATION	SAMPLE LOCATION	SAMPLING DATE	CONCENTRATION LOW/MED	NUMBER OF SAMPLES	NUMBER OF SAMPLES	NUMBER OF SAMPLES	
E 1-1	E 1	06/27/94	LOW/MED		3	1	
E 1-2	E 1	06/27/94	LOW/MED		3	1	
E 2-1	E 2	06/28/94	LOW/MED		3	1	
E 2-2	E 2	06/28/94	LOW/MED		3	1	
E 3-1	E 3	06/29/94	LOW/MED		3	1	
E 3-2	E 3	06/29/94	LOW/MED		3	1	
E 4-1	E 4	06/30/94	LOW/MED		3	1	
E 4-2	E 4	06/30/94	LOW/MED		3	1	
E 5-1	E 5	07/01/94	LOW/MED		3	1	
E 5-2	E 5	07/01/94	LOW/MED		3	1	
E 6-1	E 6	07/05/94	LOW/MED		3	1	
E 6-2	E 6	07/05/94	LOW/MED		3	1	
E 7-1	E 7	07/06/94	LOW/MED		3	1	
E 7-2	E 7	07/06/94	LOW/MED		3	1	
E 8-1	E 8	07/07/94	LOW/MED		3	1	
E 8-2	E 8	07/07/94	LOW/MED		3	1	
E 9-1	E 9	07/08/94	LOW/MED		3	1	
E 9-2	E-9	07/08/94	LOW/MED		3	1	
TOTAL LOW CONCENTRATION				0	54	18	
TOTAL MEDIUM COMCEMTRATION							

5.0 FIELD METHODS AND PROCEDURES

5.1 Subsurface Soil Collection

Access to residential properties in the study area and the background sample location will be obtained by EPA. Underground utility lines will be demarcated by utility companies prior to the sampling event.

The Geoprobe® Model 8-M van-mounted hydraulic sampling device and Geoprobe® Large Bore Samplers will be used for collecting soil samples during the investigation in accordance with the procedures outlined in the document "Region 9 FASP Standard Operating Procedure F93014, Operation of the Geoprobe for Soil Vapor, Soil Core, and Groundwater Sampling," prepared by ESAT and dated July 13, 1993 (Appendix D). Removable acetate liners will be used to collect soil samples with the Geoprobe® sampling equipment. Each acetate liner will be labeled with the sample number, date, time, and depth of collection, as well as the analyses requested. The ends of the liners will be capped with Teflon™, aluminum foil, and vinyl end caps.

In the event the Geoprobe® sampling equipment encounters refusal at shallow depths, a gas-powered auger will be used to drill 4 inch diameter holes, and a 2 inch diameter screw-type hand auger will be used to collect samples from the bottom of the augered holes. A maximum depth of approximately 6 feet is expected to be achieved for samples collected from bore holes that are drilled with the gas-powered auger. Samples collected with the gas-powered auger and hand auger combination will be collected at three foot interval depths until native soil is encountered. Samples collected by this method will be transferred to eight ounce wide mouth glass jars with a trowel or spatula. All sample containers will be filled completely and carefully to prevent soil accumulation between the lid and bottle threads. Trowels, spatulas, and all reusable sampling equipment will be decontaminated between each sample location according to the procedures described in Section 5.3, Decontamination Procedures. Samples will be placed on ice and shipped directly to the laboratory. Sample locations will be demarcated in the field with spray paint. Holes created by the drilling will be back-filled with drill cuttings and bentonite. Samples to be analyzed by the EPA Region IX Laboratory will be packaged and shipped according to the procedures described in Section 5.7, Sample Packaging and Shipment. The health and safety plan is included in Appendix E.

5.2 Sample Descriptions

Visual inspections of samples will be used to classify soils according to the following characteristics:

- Grain size distribution
- Color
- Thickness of units

- Descriptions of boundaries between units
- Texture
- Structure
- Consistency
- Plant materials and roots
- Pores
- Additional features as necessary.

The observed characteristics, as well as reults of the DDT immunoassay field test, will be used to classify the sample as either fill material, native material, or unknown material. The depth of each sample, date and time of collection, sample number, length of sample core, and the corresponding description, will be recorded in the field notebook. Also, a camera will be used to photograph selected samples.

In addition to physical descriptions of the samples, approximately 25 samples will be subject to particle size tests, by sieve methods and hydrometer tests, at an off site laboratory in order to better distinguish fill material from native material.

5.3 Decontamination Procedures

Decontamination of sampling equipment will be conducted by ESAT consistently to ensure the quality of samples collected. Equipment intended for reuse that makes contact with potentially contaminated soil, water, or sediment will be decontaminated. Disposable equipment will be packaged and included in the site waste stream. Decontamination will occur prior to and after each use of equipment.

The Geoprobe® probe rods and gas-powered auger bits will be steam cleaned before use and between sampling locations. The Geoprobe® sampling equipment and auger sampling devices will be decontaminated before use and between sampling locations according to the EPA recommended decontamination procedures outlined below:

1) Wash with tap water using a brush if necessary,
2) Wash in Liquinox and tap water solution using a brush if necessary,
3) Tap water rinse,
4) Distilled water rinse,
5) Hexane rinse,
6) Triple distilled water rinse.

5.4 Disposal of Residual Materials

The following potentially contaminated investigation derived wastes (IDW) will be generated by samplers during the investigation:

- Used personal protective equipment (PPE),

- Decontamination fluids,
- Disposable sampling equipment, and

Used ESAT PPE will be included in the site waste stream and managed according to the procedures described below.

- Used PPE and disposable equipment will be double-bagged and transported to a municipal refuse dump. These wastes are not hazardous and can be sent to a municipal landfill. If HNu readings indicate gross contamination of the refuse, ESAT will drum the waste and dispose of it in accordance with state and EPA regulations. Any PPE and disposable equipment that is to be disposed of and which can be reused will be rendered inoperable before disposal.
- Decontamination fluid generated during the investigation will consist of hexane, distilled water, and water with non-phosphate detergent. The volume and concentration of the decontamination fluid will be sufficiently low as to allow evaporation on the site.

- Soil cuttings generated during the investigation will be placed back into the soil borings from which the sample was obtained.

5.5 Field Documentation

Documentation of field activities will be kept in a site-dedicated notebook and retained in ESAT files for future reference. Entries and corrections will be initialled by the recorder. The following information should be recorded in the field notebook:

- Project name, site address, date(s), and site identification number,
- Site sketch,
- Weather description,
- Names, titles, project affiliations, and responsibilities of all field personnel and visitors at the site,
- Sample type, location descriptions, and identification numbers,
- Sample depth, date and time of collection, and length of core sample,
- Chronological description of field activities, including date and time of sampling,
- References to documents associated with the sampling effort, such as other field log books, the FSP, SAP, and health and safety plan (HSP),
- Test equipment (OVM, OVA, HNu, etc.) readings, calibration logs, models and serial numbers if test equipment will be used,
- All variances from approved Standard Operating Procedures (SOPs), the SAP, FSP, or HSP, and signature of person approving or noting variance,
- Type of sampling equipment,
- On-site measurement data related to sampling and health and safety,
- Observations and details important to the integrity of the samples that may affect data quality objectives,

- Pertinent telephone conversations and information discussed,
- Recipient laboratories,
- A summary of any meetings or discussions with any Potentially Responsible Party (PRP), PRP representatives, or federal, state, or other regulatory agency personnel,
- Levels of safety protection, and
- Signature of field supervisor.

Chain of Custody (COC) Record forms will be completed and signed by samplers and the receiving person(s) during the transfer of samples.

5.6 Photographs

Photographs will be taken at sample locations and at other areas of interest on the site. Photographs will serve to verify information entered in the field logbook.

The following information regarding each photograph should be recorded in the logbook:

- Time, date, and location,
- Complete description of the subject photographed,
- Name of photographer, and
- Sample number and depth, and date and time of collection.

5.7 Sample Packaging and Shipment

The procedures for packaging and shipping of low concentration samples are listed below. CLP paperwork will be used during sampling procedures. See Appendix F for CLP paperwork instructions.

1) Place a signed custody seal over the bottle cap.
2) Line the bottom of the cooler with bubble wrap to prevent breakage during shipment.
3) Place each individual bottle in a plastic seal-lock bag and seal the bag shut.
4) Place the protected bottles in the ice chest and add double-bagged ice or blue ice to maintain the proper temperature inside the chest. Empty water from the cooler and ensure a proper seal exists on the drain plug with tape or permanent glue. The chest must not include ice that is not bagged.
5) Fill empty spaces in the ice chest with either pelaspan (styrofoam popcorn), bubble wrap, or vermiculite.
6) Enclose the COC form CLP traffic report in the ice chest by placing it in a plastic seal-lock bag and taping the bag to the inside of the chest lid with strapping tape. Place two custody labels on the front and two on the back of each ice chest. Tape the custody seals to the ice chest with clear plastic tape. Seal the drain plug with strapping tape.

7) Label each ice chest with "FRAGILE" and "THIS END UP" labels. Include a label on each chest with the lab address and ICF ESAT return address.
8) Ship ice chests to the appropriate laboratory via Express Overnight Delivery.
9) Call RSCC at (415) 882-3069 within 24 hours of sample shipment and provide the following information:

- Sampling contractor's name
- Site name
- Case number or SAS number
- Total number(s) by concentration and matrix of samples shipped to each laboratory
- Carrier, air bill number(s), method of shipment (priority next day)
- Shipment date and intended laboratory receipt date
- Irregularities or anticipated problems associated with the samples
- Whether the current shipment is the final shipment or if additional samples will be shipped under the same case number.

6.0 QUALITY CONTROL SAMPLES

6.1 Duplicate Samples

Duplicate samples will be collected at a frequency of one per ten samples as a check on laboratory and field procedures. These samples will be collected at locations which indicate moderate levels of DDT contamination as determined by immunoassay tests. These samples will be collected, numbered, bottled, and sealed in the same manner as other samples, and will be submitted blind to the laboratory.

6.2 Equipment Rinsate Blanks

One equipment rinsate blank will be collected per day for each sampling method. Each equipment rinsate blank collected for the Geoprobe® sampling method will be collected by pouring high performance liquid chromatography- (HPLC) grade water through an acetate liner and into a one-liter amber glass bottle. Each equipment rinsate blank collected for the gas-powered auger and hand auger sampling method will be collected by pouring HPLC-grade water over the hand auger bucket and into a one-liter amber glass bottle. The equipment rinsate blanks will be analyzed for VOCs and SVOCs, including DDT isomers and degradation products, and the BHC isomers.

All blanks to be analyzed for VOCs will be collected in three 40 mL glass vials. Acidify blanks in 40 mL vials to pH < 2 with HCl by adding two drops 1:1 HCl per vial before sample collection. This is generally sufficient to obtain pH < 2, but is dependent upon the buffering capability of each aquifer and the size of drops used. Conduct a pH test on at least one vial for each day during the sampling event. The tested vial must be discarded.

If the pH is > 2, additional HCl should be added to sample vials. Another vial should be pH tested to ensure pH is now < 2. Discard the test vial.

Chill collected samples to 4°C. Blanks must be filled with zero headspace and checked for air bubbles by inverting and rapping sharply against palm. If a pea-size or larger bubble appears, another blank must be collected. If acidification causes bubbling, collect non-acidified samples and notify the Regional Sample Control Center (RSCC) coordinator.

Each blank to be analyzed for SVOCs, including DDT isomers and degradation products, and BHC isomers will be collected in a one liter amber glass bottle and chilled to 4°C.

6.3 Background Sample

One background sample will be collected at a location approximately 2 miles south of the study area, which is consistent with the background sample location of the September, 1993, Dames and Moore investigation. A description and illustration of the background sample location will be included in the field notebook.

6.4 Laboratory Quality Control Samples

One per twenty samples will be designated as a laboratory quality control (QC) sample for each matrix. These samples will be collected at locations which indicate moderate levels of DDT contamination as determined by immunoassay tests. A double volume will be collected for each laboratory QC sample.

6.5 Split Samples

Split samples will be provided to community members, property owners, and the potentially responsible party's (PRP's) contractors as necessary. Due to the two foot length of each Geoprobe sampling tube, and the planned distribution of consecutive subsamples for DDT immunoassay, VOCs and SVOCs-DDT-BHC analyses, and particle size tests from each sample tube, there will not be enough soil per sample tube for split sample distribution. However, split samples will be provided as necessary from holes drilled within a one foot radius of each sample location.

APPENDIX A

Special Analytical Services
Client Request Form
for
SVOCS, DDT Isomers and Degradation Products,
and the BHC Isomers

U. S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P. O. Box 818 · Alexandria, Virginia 22313
Phone: 703/557-2490; FTS/557-2490

SAS Number

Modified? ___ YES ___ NO

SPECIAL ANALYTICAL SERVICES

Client Request

___ Regional Transmittal ___ Telephone Request

A. **EPA Region/Client:** Region 9

B. **Region Contact:** RSCC Coordinator, ESAT, (415) 882-3069

C. **Date of Request:**

D. **Site Name:**

E. **City/State/ZIP Code:**

F. **2 Digit Superfund Site Identifier:**

G. **CERCLIS #:**

Please provide below a description of your request for Special Analytical Services under the Contract Laboratory Program. In order to most efficiently obtain laboratory capability for your request, please address all applicable questions. Incomplete or erroneous information may result in a delay in the processing of your request. If you need to provide additional information not addressed by the questions, please attach additional sheets of paper.

1. **General description of analytical service requested:**

   The analysis of low/medium soil samples for RAS semivolatile compounds with the addition of DDT isomers (2,4'- and 4,4') and degradation products (2,4',4,4'-DDD and DDE) and the hexachlorocyclohexane isomers (α,β,γ,δ-BHC).

2. **Definition and number of work units involved (specify whether whole samples or fraction; whether organics or inorganics; whether aqueous or soil and sediments; and whether low, medium or high concentration):**

   Total sample number will be determined by field screening. Anticipate no fewer than 40 and no more than 120 soil samples for organic analyses. Some samples may contain high levels of analytes; screening information will be available on chain of custodies.

3. **Purpose of analysis (specify whether Superfund [enforcement or remedial action], RCRA, NPDES, etc.):**

Superfund Enforcement

4. **Estimated date(s) of collection (provide a sampling schedule):**

Two weeks starting June 27, 1994

5. **Estimated date(s) and method of shipment:**

Overnight courier - samples are to be shipped on the day of collection for next day delivery.

6. **Number of days analysis and data required after laboratory receipt of samples:**

a. The contract required analysis holding time is ten (10) days from the date of sample receipt by the laboratory.

b. The technical analysis holding time is fourteen (14) days from the date of sample collection for soil samples.

c. Form 1s are required within 10 days of sample receipt. Data packages and all other deliverables are required within 35 days from receipt of last sample in each Sample Delivery Group (SDG). A SDG is defined as all samples received within a 14 day period or 20 samples, whichever is reached first.

7. **Analytical protocol required (attach copy if other than a protocol currently used in this program):**

a. Follow the procedures outlined in Exhibit D of the CLP SOW (OLM01.9 or more recent version) for the analysis of SVOCs in soil by gas chromatography/mass spectrometry (GC/MS).

b. A list of the SVOC target compounds and additional target pesticides with corresponding contract required quantitation limits (CRQL) is provided in Table 1 of this special analytical services (SAS) client request form (CRF).

8. **Special technical instructions (if outside protocol requirements, specify compound names, CAS numbers, detection limits, etc.):**

a. **<u>Calibration Procedure and Criteria</u>:**

Apply all tuning and calibrationion procedures in the EPA SOW OLMO1.9 to analyte list including additional pesticides.

b. **Internal Quality Control Checks, Control Limits and Corrective Actions:**

1. Follow all internal quality control tuning and calibrationion procedures in the EPA SOW OLMO1.9 to analyte list including additional pesticides.

2. Dilute and reanalyze samples which contain one or more target analytes at concentrations above the initial calibration range. If dilution is necessary, adjust the dilution so that the most highly concentrated analyte is determined at a concentration in the upper half of the calibration range. Report the results and submit documentation for both the diluted and undiluted analyses.

3. The QC requirements listed above are the minimum required. It is impossible to address all analytical situations that might be experienced by a laboratory during the analysis of environmental samples. The laboratory is expected to adhere to good laboratory practices when analyzing samples. If the laboratory has questions concerning the analyses of samples not addressed in this document, the Region should be notified IMMEDIATELY (through the Sample Management Office).

9. **Analytical results required (if known, specify format for data sheets, QA/QC reports, Chain-of-Custody documentation, etc.) If not completed, format of results will be left to program discretion.**

a. **Data Calculations and Reporting Units:**

1. Follow all data reporting requirements in EPA SOW OLMO1.9 including additional pesticides on all appropriate forms.

2. Ensure that all records of analysis, dilutions and calculations are legible and sufficient to recalculate all sample concentrations and QC results. Include an example of an *actual* sample calculation in the data package.

b. **Documentation and Deliverables:**

All documentation and deliverables as required in Exhibit B of the CLP SOW (OLM01.9 or more recent version) must be submitted. The required deliverables for each sample delivery group include, but are not limited to, the following:

1. All Sample Tracking Reports (i.e., signed SAS Packing Lists/Chain-of-Custody forms).

2. Complete SDG File (CSF) inventory on a modified CLP Form DC-2.

3. Sample log-in information on a modified CLP Form DC-1.

4. A copy of the SAS CRF, as provided by SMO (so that any revisions or additions authorized by SMO will be known). Only the technical portion of the SAS CRF is required.

5. Any telephone logs referring to the samples.

6. An SDG Narrative which includes: a signature of the laboratory manager (or his or her designee), laboratory name, EPA laboratory I.D., contract number, SAS number, SDG number, a description of any problems encountered during the processing of the samples, a description of the resolution of these problems, a list of correct EPA sample I.D. numbers, the corresponding laboratory sample I.D. numbers, a differentiation between the initial analyses and any reanalyses, the pH of all water samples, a formula (including definitions) showing how the results were calculated, and an example of an *actual* calculation for a sample in the SDG.

7. Modified CLP Form 1-SV-1,SV-2 for all environmental and QC samples which lists the tabulated sample results for all target analytes. The header of the Form 1-SV-1,SV-2 should include: sample matrix, analyte concentration units, sample volume, purge volume, dilution factor, and dates of sample receipt and analysis. Form 1s for any reanalyses or diluted analyses must be included.

8. Modified CLP Form 1E for all environmental samples which lists tentatively identified compounds. The header information should be the same as that provided in Form 1-SV-1,SV-2.

9. Modified CLP Form 2-SV which lists the percent recovery (%R) values of the system monitoring compounds for all samples and laboratory method blanks.

10. Modified CLP Form 3-SV, a matrix spike/matrix spike duplicate (MS/MSD) results summary, which reports the percent recovery (%R) and relative percent difference (RPD) values for the spiked compounds.

11. Modified CLP Form 4-SV which summarizes the samples that were analyzed with each laboratory method blank.

12. CLP Form 5-SV which summarizes the data for DFTPP instrument performance checks.

13. Modified CLP Form 8-SV which summarizes areas and retention times of the internal standards for all samples, blanks, QC samples, and continuing calibration standards.

14. Raw sample data which include the following items:

    a. Reconstructed ion chromatogram (RIC) and mass spectra

b. GC/MS quantitation report/data system printout
c. Manual work sheets

15. Instrument calibration data which include the following items:

a. Initial Calibration

(1) Modified CLP Form 6-SV which includes: relative response factors (RRFs) for each analyte for each concentration level and percent relative standard deviations (%RSD) for each analyte.

(2) Header of the modified CLP Form 6-SV must include: date and time of calibration, instrument I.D., and gas chromatographic (GC) analytical column I.D. (i.e. liquid phase, length, diameter).

(3) Raw data which include: RICs and quantitation reports/data system printouts. Peak areas, concentrations, and RTs must be clearly indicated.

b. Continuing Calibration

(1) Modified CLP Form 7-SV which includes: average relative response factors (RRFs) (from the initial calibration), RRFs (for the continuing calibration standard), and percent difference (%D) values for each analyte.

(2) Header of the modified CLP Form 7-SV must include: date and time of calibration, instrument I.D., and GC analytical column I.D.

(3) Raw data which include: RICs and quantitation reports/data system printouts. Peak areas, concentrations, and RTs must be clearly indicated.

16. Raw QC data which include the following items:

a. Blank data, in chronological order:

1. Tabulated results on a modified CLP Form 1-SV-1,SV-2
2. RIC
3. GC/MS quantitation report/data system printout
4. Manual work sheet

b. MS/MSD data, in chronological order:

1. Tabulated results on a modified CLP Form 1-SV-1,SV-2
2. RIC
3. GC/MS quantitation report/data system printout
4. Manual work sheet

17. Bench sheets for pH determination and dilutions. Bench sheets for sample preparation which include spike solution and system monitoring compound solution description (i.e. concentrations and volume added.)

18. Standards preparation logs, for all standards used for either calibration or spiking, which include source, traceable lot number, and concentrations of all compounds.

10. **Other (use additional sheets or attach supplementary information, as needed):**

Attached is a copy of the "U. S. EPA Region 9 Laboratory QC Summary Report" form. This form is to be completed by the Laboratory Manager or his/her designee and submitted with each data package. The form is to reflect the conditions contained within the data package with which it is submitted. Laboratories may make additional copies of this form as needed.

11. **Name of sampling/shipping contact:**

Phone: ( )

12. **Data Requirements:**

Parameter	Contract Required Quantitation Limit (CRQL)
Volatile organic compounds	refer to Table 1

13. **QC Requirements:**

QC Required	Frequency of QC	Limits (% or Conc.)
Laboratory method blanks	as per CLP SOW	<CRQL
MS/MSD	1 per SDG	as per CLP SOW

14. **Action required if limits are exceeded:**

If system monitoring compound control limits are exceeded, take appropriate actions to identify the problem by reanalyzing the affected samples. If a matrix problem is not indicated, corrective action should be taken before additional samples are analyzed.

TABLE 1
TARGET COMPOUND LIST

COMPOUND	CAS NUMBER	CRQL (ug/Kg)
Phenol	108-95-2	330
bis-(2-chloroethyl)ether	111-44-4	330
2-Chlorophenol	95-57-8	330
1,3-Dichlorobenzene	541-73-1	330
1,4-Dichlorobenzene	106-46-7	330
1,2-Dichlorobenzene	95-50-1	330
2-Methylphenol	95-48-7	330
2,2'-oxybis(1-Chloropropane)	108-60-1	330
4-Methylphenol	106-44-5	330
N-Nitroso-Di-propylamine	621-64-7	330
Hexachloroethane	67-72-1	330
Nitrobenzene	98-95-3	330
Isophorone	78-59-1	330
2-Nitropenol	88-75-5	330
2,4-Dimethylphenol	105-67-9	330
bis-(2-chloroethoxy)methane	111-91-1	330
2,4-Dichlorophenol	120-83-2	330
1,2,4-Trichlorobenzene	120-82-1	330
Napthalene	91-20-3	330
4-Chloroaniline	106-47-8	330
Hexachlorobutadiene	87-68-3	330
4-Chloro-3-methylphenol	59-50-7	330
2-Methylnapthalene	91-57-6	330
Hexachlorocyclopentadiene	77-47-4	330
2,4,6-Trichlorophenol	88-06-2	330
2,4,5-Trichlorophenol	95-95-4	830
2-Chloronapthalene	91-58-7	330
2-Nitroaniline	88-74-4	830
Dimethyl phthalate	131-11-3	330
Acenapthylene	208-96-8	330
2,6-Dinitrotoluene	606-20-2	330
3-Nitroaniline	99-09-2	830
Acenaphthene	83-32-9	330
2,4-Dinitrophenol	51-28-5	830
4-Nitrophenol	100-02-7	830
Dibenzofuran	132-64-9	330

2,4-Dinitrotoluene	121-14-2	330
Diethylphthalate	84-66-2	330
4-Chlorophenyl-phenylether	7005-72-3	330
Florene	86-73-7	330
4-Nitroaniline	100-01-6	830
4,6-Dinitro-2-methyl-phenol	534-52-1	830
N-Nitrosodiphenylamine	86-30-6	330
4-Bromophenyl-phenylether	101-55-3	330
Hexachlorobenzene	118-74-1	330
Pentachlorophenol	87-86-5	830
Phenanthrene	85-01-8	330
Anthracene	120-12-7	330
Carbozole	84-74-8	330
Di-n-butylphthalate	84-74-2	330
Fluoranthene	206-44-0	330
Pyrene	129-00-0	330
Butylbenzylphthalate	85-68-7	330
3,3'-Dichlorobenzidine	91-94-1	330
Benzo(a)anthracene	56-55-3	330
bis-2_Ethylhexlyphthalate	117-81-7	330
Chrysene	218-01-9	330
Di-n-Octylphthalate	117-84-0	330
Benzo(b)fluoranthene	205-99-2	330
Benzo(k)fluoranthene	207-08-9	330
Benzo(a)pyrene	50-32-8	330
Indeno(1,2,3-cd)pyrene	193-39-5	330
Dibenzo(a,h)anthracene	53-70-3	330
Benzo(g,h,i)perylene	191-24-2	330
Additional Analytes		
4,4'-DDT	50-29-3	330
4,4'-DDE	72-55-9	330
4,4'-DDD	72-54-8	330
2,4'-DDT	789-02-6	330
2,4'-DDE	3424-82-6	330
2,4'-DDD	53-19-0	330
α-BHC	319-84-6	330
β-BHC	319-85-7	330
γ-BHC (Lindane)	58-89-9	330
δ-BHC	319-86-8	330

Laboratory: Earth Technologies.

U. S. ENVIRONMENTAL PROTECTION AGENCY
CLP Sample Management Office
P. O. Box 818 - Alexandria, Virginia 22313
Phone: 703/557-2490; FTS/557-2490

SAS Number

Modified? ___ YES ✓ NO

SPECIAL ANALYTICAL SERVICES

Client Request

_____ Regional Transmittal _____ Telephone Request

A. EPA Region/Client: Region 9

B. Region Contact: RSCC Coordinator, ESAT, (415) 882-3069

C. Date of Request: 06/13/94

D. Site Name: Montrose Chemical Superfund Site

E. City/State Torrance, Los Angeles County, California

F. 2 Digit Superfund Site Identifier:

Please provide below a description of your request for Special Analytical Services under the Contract Laboratory Program. In order to most efficiently obtain laboratory capability for your request, please address all applicable questions. Incomplete or erroneous information may result in a delay in the processing of your request. If you need to provide additional information not addressed by the questions, please attach additional sheets of paper.

1. General description of analytical service requested:

   The determination of particle size (or grain size) in soil following ASTM D 422 protocols.

2. Definition and number of work units involved (specify whether whole samples or fraction; whether organics or inorganics; whether aqueous or soil and sediments; and whether low, medium or high concentration):

   20 whole soil samples, low concentration, for particle size determination.

3. Purpose of analysis (specify whether Superfund [enforcement or remedial action], RCRA, NPDES, etc.): Superfund enforcement

4. **Estimated date(s) of collection (provide a sampling schedule):**

06/27/94 to 07/08/94

5. **Estimated date(s) and method of shipment:**

~~Federal Express - shipped same day as collection for next day delivery.~~ OR
Special delivery by courier.

6. **Number of days analysis and data required after laboratory receipt of samples:**

The contract required analysis holding time is 25 days from the date of sample receipt by the laboratory.

Data packages and all other deliverables are required within 35 days from receipt of last sample in each Sample Delivery Group (SDG). A SDG is defined as all samples received within a 14 day period or 20 samples, whichever is reached first.

7. **Analytical protocol required (attach copy if other than a protocol currently used in this program):**

Follow ASTM D 422, "Standard Test Method for Particle Size Analysis of Soils."

1. There is no detection limit for particle size.

2. The sieve sizes should comply with the ASTM D 422 recommendations in Section 3.6.

8. **Special technical instructions (if outside protocol requirements, specify compound names, CAS numbers, detection limits, etc.):**

a. Calibration Procedure and Criteria: Not applicable.

b. Internal Quality Control Checks, Control Limits and Corrective Actions:

1. The laboratory must report at least two determinations of grain size for each sample. The laboratory is to report the average of these determinations and the relative percent difference (RPD) between sample results. The RPD is not to exceed ±20%. If the initial two determinations differ by more than ±20%, repeat and report the average of 4 determinations.

9. **Analytical results required (if known, specify format for data sheets, QA/QC reports, Chain-of-Custody documentation, etc.) If not completed, format of results will be left to program discretion.**

a. Data Calculations and Reporting Units:

Follow the Calculations and Report Sections 12 through 18 of ASTM D 422 for a description of the reporting requirements.

b. Documentation and Deliverables:

Deliverables (in the form of a purge file - i.e., original documents) for each Sample Delivery Group shall include all deliverables required by the IFB, including, but not limited to:

1. All Sample Tracking Reports (i.e., signed SAS Packing Lists/Chain-of-Custody forms).

2. A copy of the SAS, as provided by SMO (so that any SMO changes will be known). Only the technical portion of the SAS is required.

3. Any telephone logs referring to the samples.

4. A Case Narrative, signed by the laboratory manager or his or her designee, certifying the accuracy and validity of all data reported and describing any problems encountered during the analyses and documenting their resolution(s).

5. Tabulated sample results with units. Report all sample determinations.

6. Duplicate results with calculated relative percent difference (RPD).

7. Raw sample, including:

   a. bench sheets and worksheets
   b. tabulated results

10. **Other (use additional sheets or attach supplementary information, as needed):**

Attached is a copy of the "U. S. EPA Region 9 Laboratory QC Summary Report" form. This form is to be completed by the Laboratory Manager or his/her designee and submitted with each data package. The form is to reflect the conditions contained within the data package with which it is submitted. Laboratories may make additional copies of this form as needed.

11. **Name of sampling/shipping contact:**

Phone: ( ) Dan Rodoni, ESAT/ICF
(415) 882-3043

12. **Data Requirements:**

Parameter	Detection Limit
Grain Size	Not Applicable

13. **QC Requirements:**

QC Required	Frequency of QC	Limits (% or Conc.)
Laboratory Duplicates	Every sample	RPD <±20%

14. **Action required if limits are exceeded:**

If above control limits are exceeded, take appropriate actions to identify the problem by reanalyzing the affected samples. Corrective action should be taken before additional samples are analyzed.

APPENDIX B

Region 9 FASP Standard Operating Procedure

F93025

Immunoassay Field Testing of DDT in Soils

REGION 9 FASP STANDARD OPERATING PROCEDURE
F93025

ANALYSIS OF PESTICIDES IN SOIL SAMPLES BY EnviroGard™ DDT SOIL TEST KIT

Revision 1.0
June 16, 1994

Environmental Services Assistance Team
ICF Kaiser International, Inc.

for

EPA Region 9
Environmental Services Branch

1.0 Title: **Analysis of Pesticides in Soil Samples by EnviroGard™ DDT Soil Test Kit**

2.0 References: Millipore, EnvviroGard™ DDT in Soil Test Kit, Draft Procedure, ENVR-00031.

3.0 Scope and Application:

This method describes procedures for a qualitative or semi-quantitative field test for the detection of DDT and its metabolites DDD and DDE in soil samples using a EnviroGard™ DDT Soil Test Kit. The EnviroGard™ DDT in Soil Test Kit allows rapid semi-quantitative screening for DDT at a minimum of 0.2, 1.0, and 10.0 parts per million (ppm) in soil samples, and may be adjusted for higher quantitation limits by dilution of soil extracts.

4.0 Summary of Method:

Soil samples are collected and analyzed by using a EnviroGard™ DDT Soil Test Kit. Detection of the compounds DDT, DDD and DDE is accomplished by use of polyclonal antibodies that bind either DDT or DDT-Enzyme Conjugate. These antibodies are immobilized on the walls of the test tubes. When DDT or DDT metabolites are present in a sample, or competes with the DDT-Enzyme Conjugate for limited number of antibody binding sites.

* A sample containing DDT is added to a test tube containing Assay Diluent. DDT-Enzyme Conjugate is then added to the test tube. The DDT-Enzyme Conjugate competes with the DDT for the antibody binding sites.

* After the incubation, the unbound molecules are washed away.

* A clear solution of chromogenic Substrate is then added to the test tube. In the presence of bound DDT-Enzyme Conjugate, the clear Substrate is converted to a blue color. One enzyme molecule can convert many Substrate molecules.

Since there are the same number of antibody binding sites on every test tube and each test tube receives the same number of DDT-Enzyme Conjugate molecules, a sample that contains a low concentration of DDT allows the antibody to bind many DDT-Enzyme Conjugate molecules. Therefore, a low concentration of DDT produces a dark blue solution. Conversely, a high concentration of DDT allows fewer DDT-Enzyme Conjugate molecules to be bound by the antibodies, resulting in a lighter blue solution.

5.0 Method Analytes:

The EnviroGard™ DDT in Soil Test Kit will not differentiate between DDT, its metabolites, and other structurally similar compounds, but will detect their presence to differing degrees. The following table shows a number of compounds and the approximate concentration of each required to yield a positive result (Lower Limit of Detection or LLD), and the concentration required to inhibit one-half of the color developed by the Negative Control(IC50). Concentration is in parts per

million(ppm) in soil.

Compound	LLD	IC50
p,p-DDT (Kit calibrator)	0.04	1.25
p,p-DDD	0.01	0.3
p,p-DDE	0.18	3.6
o,p-DDT	4	93
o,p-DDD	0.4	11
o,p-DDE	3	93
DDA	0.002	0.04
Chloropropylate	0.007	0.08
Chlorobenzilate	0.03	0.35
Dicofol	0.14	2
Tetradifon	1.2	14
Thiobencarb	5	52
Tebuconazole	7	95
Neburon	17	284
Chloroxuron	24	216
Monolinuron	25	714
Diclofop	70	>1000

6.0 Apparatus and Materials

6.1 Apparatus: EnviroGard™ DDT in Soil Test Kit

6.2 Materials

6.2.1 Extraction Kit

* 30mL Polypropylene Bottles with screw caps containing stainless steel mixing beads
* Filtration caps
* Millex® HV_{13} filters
* Wooden Spatulas
* Syringe with coupler
* Syringe coupler
* Screw Top Glass Vials, 4.0 mL
* Stoppers
* Weigh Boats
* ACS reagent grade Methanol
* Analytical Balance

6.2.2 Test Kit

* Antibody-Coated Test Tubes
* Assay Diluent
* Negative Control (Methanol)
* 0.2 ppm DDT Calibrator in methanol
* 1.0 ppm DDT Calibrator in methanol
* 10.0 ppm DDT Calibrator in methanol
* DDT-Enzyme Conjugate
* Substrate
* Stop Solution
* Test Tube Rack

* Pipette Tips, yellow
* Gilson M-25 Microman Positive Displacement Pipettor
* Eppendorf™ Repeater® Pipettor and Combitips®
* Millipore Differential Photometer
* Watch or timer
* Deionized water
* Calculator

7.0 Sample Analysis

7.1 Sample Preparation

7.1.1 Collect soil in appropriately-sized and labeled containers. Soil samples collected using Geoprobe for bore hole logging will be subsampled for immuno assaay testing.

7.1.2 Take care to remove excess twigs, organic matter and rocks or pebbles from the sample. For best results, wet soils should be air-dried overnight and thoroughly mixed before testing.The degree of moisture in terms of dry, moist, wet will be noted in the immunoassay run book when soil are analyzed.

7.1.3 Store soil samples at 4°C (39°F)

7.1.4 Weigh 5 grams of soil sample and put into an extraction vial. Attach a 50-mL Combitip to the Repeater pipettor and set the dial to 5. Deliver once to add 5 mL of methanol to the vial and cap tightly.

7.2 Analytical Procedures

7.2.1 Allow all reagents and sample extracts to reach room temperature. Remove the test tubes from the plastic bag and label them as follows:

Tube Label	Tube Contents
NC	Negative Control
C1	0.2 ppm Calibrator
C2	1.0 ppm Calibrator
C3	10.0 ppm Calibrator
S1	Sample 1
S2	Sample 2
etc.	

7.2.2 Attach the 12.5 mL Combitip labeled "Diluent" to the Repeater pipettor and adjust the dial to 2. Add 500 uL of Assay Diluent to each test tube.

7.2.3 Attach a clean pipette tip to the Micromanan pipettor and adjust the dial to "250". Add 25 uL of each calibrator (including Negative Control) to the corresponding test tube by placing the end of the pipette tip against the side of

the tube (just above the level of the Assay Diluent) and dispensing the volume. Use a clean pipette tip each time.

7.2.4 Using a clean tip for each sample, add 25 uL of each sample extract to the appropriately-labeled test tube.

7.2.5 Attach the 5.0-mL Combitip labeled "Conjugate" to the Repeater pipettor and adjust the dial to 1. Add 100 uL of DDT-Enzyme Conjugate to each test tube.

7.2.6 Shake the test tube rack to mix for 10 to 15 seconds. Leave the test tubes undisturbed for 15 minutes.

7.2.7 Vigorously shake out the test tube contents into a waste container. Fill the test tubes to overflowing with cool tap or distilled water, then decant and vigorously shake out the remaining water. Repeat this wash step three more times.

7.2.8 Attach the 12.5 mL Combitip labeled "Substrate" to the Repeater pipettor and set the dial to 2. Add 500 uL of Substrate to each test tube. Leave the test tubes undisturbed for 10 minutes.

NOTE: If a blue color does not develop in the Negative Control test tube within 10 minutes after adding the Substrate, the test is invalid and must be repeated.

8.0 Analytical Results

8.1 Visual Results

After you add the Substrate, wait 10 minutes then mix the test tubes by shaking them for a few seconds until they are a uniform blue color. Compare the sample test tube to the calibrator test tubes against a white background. The test tube rack in the kit is well-suited for this purpose.

8.1.1 If a sample test tube contains more color than the calibrator test tube, the sample contains DDT at a concentration lower than the calibrator.

8.1.2 If a sample test tube contains less color than the calibrator test tube, the sample may contain DDT at a concentration greater than the calibrator.

8.1.3 If the sample test tube contains color that is between the calibrator test tubes, the sample contains DDT at a concentration between the calibrator concentrations.

8.1.4 If a sample test tube contains approximately the same amount of color as the calibrator test tube, the sample contains DDT at a concentration approximately equal to the calibrator.

8.1.5 If the sample test tube contains less color than the 100 ppm

Calibrator test tube, you may dilute a fraction of the soil extract in methanol (for example, 1:100) and perform the assay again. To determine the concentration of the diluted extract multiple result by the dilution factor.

NOTE: The word DDT in the results refers to "total DDT", i.e. the sum of p,p-DDT, p,p-DDD, and p,p-DDE.

8.2 Photometric Results

After you add the Substrate, wait 10 minutes then add the Stop Solution to each test tube. Attach the 12.5 mL Combitip labeled "Stop" to the Repeater pipettor and set the dial to 2. Add 500 uL of Stop Solution to each test tube. This converts the blue color in the test tubes to yellow.

WARNING: Stop solution is 1N Hydrochloric acid. Handle carefully.

8.2.1 Place a water blank test tube containing 1.5 mL of Milli-RO® or Milli-Q® water, or equivalent in the left (reference) well.

8.2.2 Place the Negative Control test tube into the right (sample) well. Record the optical density (OD) of the Negative Control.

8.2.3 Remove the Negative Control test tube and replace it with the 0.2 ppm Calibrator test tube to reactivate the photometer. Record the result. Repeat this step to determine the OD for each of the remaining calibrators and for each sample.

8.3 Semi-quantitative Results

Compare the OD of each sample to the OD of each calibrator

8.3.1 If a sample OD is equal to the OD of a calibrator, the sample contains DDT at a concentration approximately equal to the calibrator.

8.3.2 If a sample OD is greater than a calibrator OD, the sample contains less DDT than the calibrator.

8.3.3 If a sample OD is lower than a calibrator OD, the sample may contain more DDT than that calibrator.

8.3.4 Calibration range is from 0 to 10ppm. If an assay result indicates that a soil sample contains greater than 10ppm total DDT, you may dilute soil extract with methanol and perform the assay again. The results of the diluted sample must multiply with dilution factor to determine the approximate sample concentration of the original sample.

9.0 Quality Control

A field control spike with known DDT concentration will be run before and after every 10 samples for reference and quality control.

10.0 Limitations of the Procedure

The EnviroGard™ DDT in Soil Test Kit is a qualitative/semi-quantitative screening test only. Actual quantitation of DDT by EnviroGard immunoassay is not possible due to the Test kit's cross-reactivity with DDT breakdown products and other similar compounds and to the variations in extraction efficiency inherent in the fast extraction protocol described in this product insert.

Soil sampling error may significantly affect testing reliability. The distribution of pesticides in different soils can be extremely heterogeneous. Soils should be dried and homogenized before analysis by any method.

APPENDIX C

Target Analyte List
for
Montrose Site Investigation:
Semivolatiles and Pesticides

TARGET ANALYTE LIST FOR MONTROSE SITE INVESTIGATION
Semivolatiles and Pesticides

Compound	CAS Number	Concentration (µg/kg)
Phenol	108-95-2	330
bis-(2-chloroethyl)ether	111-44-4	330
2-Chlorophenol	95-57-8	330
1,3-Dichlorobenzene	541-73-1	330
1,4-Dichlorobenzene	106-46-7	330
1,2-Dichlorobenzene	95-50-1	330
2-Methylphenol	95-48-7	330
2,2'-oxybis(1-Chloropropane)	108-60-1	330
4-Methylphenol	106-44-5	330
N-Nitroso-Di-propylamine	621-64-7	330
Hexachloroethane	67-72-1	330
Nitrobenzene	98-95-3	330
Isophorone	78-59-1	330
2-Nitropenol	88-75-5	330
2,4-Dimethylphenol	105-67-9	330
bis-(2-chloroethoxy)methane	111-91-1	330
2,4-Dichlorophenol	120-83-2	330
1,2,4-Trichlorobenzene	120-82-1	330
Napthalene	91-20-3	330
4-Chloroaniline	106-47-8	330
Hexachlorobutadiene	87-68-3	330
4-Chloro-3-methylphenol	59-50-7	330
2-Methylnapthalene	91-57-6	330
Hexachlorocyclopentadiene	77-47-4	330
2,4,6-Trichlorophenol	88-06-2	330
2,4,5-Trichlorophenol	95-95-4	800
2-Chloronapthalene	91-58-7	330
2-Nitroaniline	88-74-4	800
Dimethyl phthalate	131-11-3	330
Acenapthylene	208-96-8	330
2,6-Dinitrotoluene	606-20-2	330
3-Nitroaniline	99-09-2	800
Acenaphthene	83-32-9	330
2,4-Dinitrophenol	51-28-5	800
4-Nitrophenol	100-02-7	800
Dibenzofuran	132-64-9	330
2,4-Dinitrotoluene	121-14-2	330
Diethylphthalate	84-66-2	330
4-Chlorophenyl-phenylether	7005-72-3	330
Florene	86-73-7	330

APPENDIX D

Region 9 FASP Standard Operating Procedure

F93014

Operation of the Geoprobe for Soil Vapor,
Soil Core, and Groundwater Sampling

REGION 9 FASP STANDARD OPERATING PROCEDURE
F93014

OPERATION OF THE GEOPROBE FOR SOIL VAPOR, SOIL CORE, AND GROUNDWATER SAMPLING

Revision 1.0
July 13, 1993

Prepared by:

Environmental Services Assistance Team
ICF Technology, Inc.

for

Region 9
Environmental Services Branch

1.0 TITLE: **Operation of the 8-M Geoprobe System**

2.0 REFERENCES

8-M Operations Manual, Geoprobe Systems, July 27, 1990.

3.0 SCOPE AND APPLICATION:

This Standard Operating Procedure (SOP) is intended to supplement the procedures presented in the Geoprobe 8-M Operations Manual. This SOP covers collection of soil vapor, soil core, and groundwater samples using the Geoprobe.

4.0 SUMMARY OF METHOD:

The Geoprobe is a vehicle-mounted hydraulic soil-probing device which applies both static force and percussion hammering for tool placement. Depending on the type of media to be collected, different sampling attachments are used. Sampling attachments include tube adapters for collection of soil vapor, piston driven tubes for collection of soil samples, and mill-slotted rods for collection of groundwater samples.

5.0 LIMITATIONS:

Operators should consider the following limitations when using the Geoprobe:

- The sampling attachments may not reach the desired depth due to subsurface geologic features such as hardpan, cobbles, rocks, roots, or buried objects.
- The amount of sample collected may be less than the desired volume.
- The probe borehole may create a conduit for entry into the subsurface and the hole may need to be filled with grout before abandonment.
- The presence of subsurface utilities may hinder the use of the Geoprobe in some areas.

In addition, all Geoprobe operators should be familiar with the safety precautions contained in Section 9.0 of this SOP.

6.0 APPARATUS AND MATERIALS:

6.1 GENERAL TOOLS

- Probe Rods (36", 24", and 12")
- Cleaning Brush
- Cleaning Brush Adapter
- Drive Caps
- Pull Caps
- Probe Rod Pull Plate
- Solid Drive Points
- Rod Extractors
- GSK-58 Hammer Anvils
- Drill Steel (36")
- Carbide-Tipped Drill Bit (2" Diameter)
- Thread Chaser
- GSK-58 Hammer Latch
- Hammer Latch Tool
- GSK-58 Wire Ring

6.2 SOIL VAPOR SAMPLING TOOLS

- Stainless 3/16" Post-Run Tubing (PRT) Adapters
- "O"-rings for PRT Adapters
- PRT Expendable Point Holders
- Expendable Drive Points
- Drive Point "O"-rings
- Retractable Point Assemblies
- Retractable Point "O"-rings
- Teflon Tubing (1/4" O.D. × 3/16" I.D.)
- Post Run Point Popper

6.3 SOIL SAMPLING TOOLS

- Large Bore Sampler Assembled Kits
- Large Bore Cutting Shoes (extras)
- Large Bore Acetate Liners
- Piston Stop-Pins (extras)
- Extension Rods, Couplers, and Handle
- Vinyl End Caps

6.4 GROUNDWATER SAMPLING TOOLS

- Complete Mill-Slotted Assemblies
- Tubing Bottom Check Valves
- Check Balls
- Polyethylene Tubing (3/8" O.D. × 1/4" I.D.)
- GW Expendable Drive Points
- GW Drive Point "O"-rings

6.5 HEALTH AND SAFETY EQUIPMENT

- Safety Glasses
- Ear Protection
- Steel-toed shoes
- Hardhats
- Leather Gloves
- Wheel Chocks
- Vehicle Exhaust Ventilation Hoses

7.0 PROCEDURE:

7.1 GEOPROBE POSITIONING:

7.1.1 Position the vehicle at the desired sampling location. Place the transmission in park, set the parking brake, turn off the ignition and chock the wheels.

7.1.2 The remote ignition switch is located on the control panel near the Geoprobe operator position on the inner wall of the vehicle and the ELECTRICAL control switch for the hydraulic system is located on the control panel at the Geoprobe operator position. Before starting the vehicle engine using the remote ignition switch, ensure the ELECTRICAL control switch for the hydraulic system is in the "off" position (Figure 7.1.1).

7.1.3 Activate the Geoprobe hydraulic system by turning the ELECTRICAL control switch to the "slow" speed. Always use the "slow" hydraulic speed when moving the probe (Figure 7.1.1).

7.1.4 Movement of the Geoprobe is controlled by levers located on a control panel at the Geoprobe operator position. The operator moves each lever up or down to control individual cylinder movement (Figures 7.1.1 and 7.1.2).

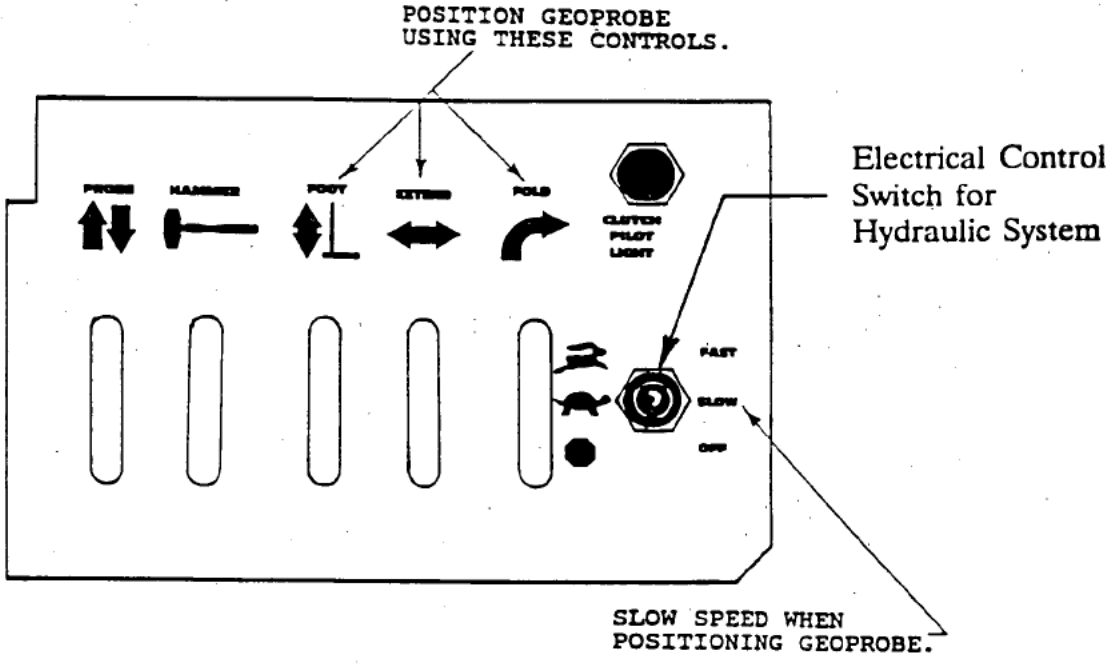


FIGURE 7.1.1 CONTROL PANEL OF GEOPROBE

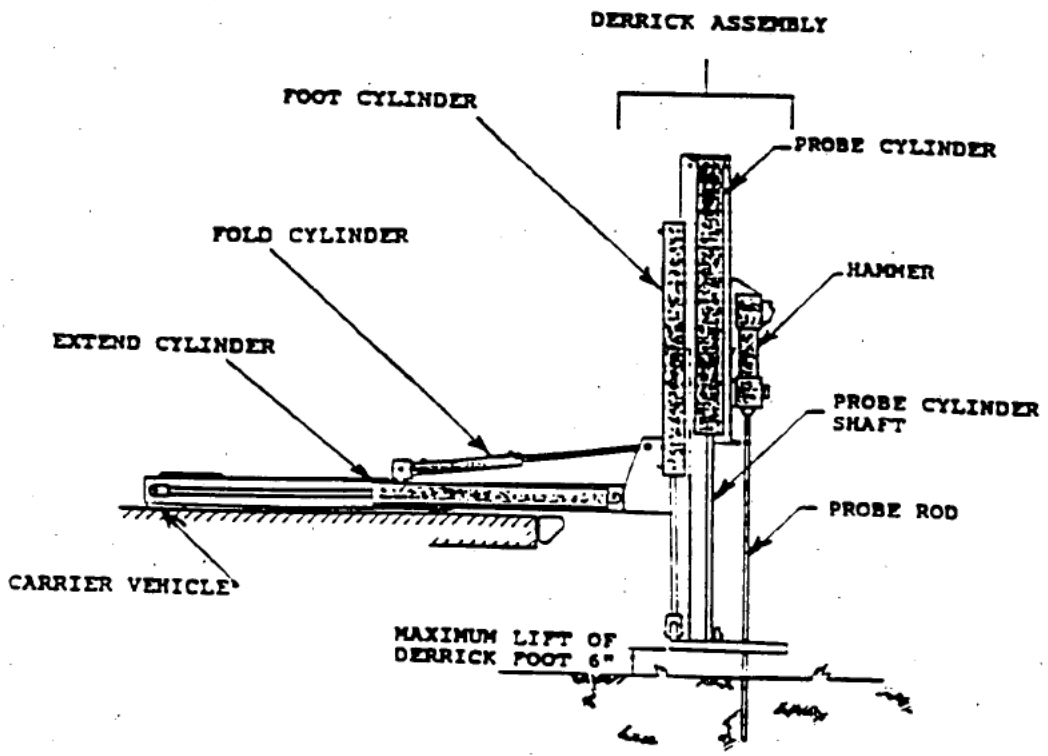


FIGURE 7.1.2 CYLINDERS OF GEOPROBE

7.1.4.1 FOOT control lever: This control activates the Foot cylinder which moves the derrick assembly up and down.

7.1.4.2 EXTEND control lever: This control activates the Extension cylinder which moves the Geoprobe in and out of the vehicle.

7.1.4.3 FOLD control lever: This control activates the Fold cylinder and rotates the Geoprobe up to 90°.

7.1.4.4 HAMMER control lever: This control activates the hammer.

7.1.4.5 PROBE control lever: This control activates the Probe cylinder which moves the Probe and Hammer up and down. The PROBE control is used to drive the probe rods to the sampling depth using the static weight of the vehicle.

7.1.5 Use the FOLD, FOOT, and EXTEND controls to remove the Geoprobe from the vehicle without clipping the ceiling of the vehicle. Place the Geoprobe in the exact sampling position, being certain the probe cylinder shaft is perpendicular to the ground. The Geoprobe should not be fully extended from the vehicle during operation.

7.1.6 Use the FOOT control to raise the rear of the vehicle to apply static pressure to the probe unit. The rear of the vehicle should not be raised more than 6 inches off the ground. The wheels of the vehicle must remain in contact with the ground surface to prevent shifting or tipping during Geoprobe operation.

7.2 PROBING: GENERAL

Operation of the Geoprobe may be done using one of three methods, alone or in combination. The first method, static force probing, is accomplished using the weight of the vehicle alone. In some soils, the probe will not advance solely with static force and the second method, percussion hammering, is necessary. In cases where it is necessary to drill through asphalt or hard surface soils, the third method, drilling, is applicable. The hammer is used in combination with a carbide-tipped bit to drill up to 2 feet below the surface. The last two methods require the use of both the PROBE and HAMMER controls to advance the probe.

7.3 PROBING: STATIC FORCE

7.3.1 Turn off the hydraulic system by positioning the ELECTRICAL control switch to "stop." Lift the hammer latch up, insert a hammer anvil, and close the hammer latch (Figure 7.3.1).

7.3.2 Screw a drive cap on the first probe rod (Figure 7.3.2).

7.3.3 Screw an expendable point holder onto the first probe rod.

7.3.4 Slip an expendable drive point into the point holder.

7.3.5 Position probe rod in the center of the derrick foot below the hammer anvil. The probe rod and probe cylinder shaft must be vertically aligned.

7.3.6 Turn the ELECTRICAL control switch to "slow" to activate the hydraulics. Push down on the PROBE control lever to begin probing.

7.3.7 The vertical alignment of the probe rod and probe cylinder shaft must be kept constant during probing and can be adjusted using the FOLD control.

7.4 PROBING: PERCUSSION HAMMER

7.4.1 Follow procedures in Section 7.1 for positioning the first probe rod.

7.4.2 Apply the percussion hammer to the probe rod, with attached drive point, by pushing down on the HAMMER control lever. The hammer anvil must be kept on the drive cap to prevent vibration. Maintain static force on the probe rod by pushing down on the PROBE control lever.

7.4.3 Penetration of the probe rod is controlled by the PROBE control and should be done in 2 inch increments. The rods must be hand tightened during probing if the threads loosen due to hammering. The rods must be tightened while static force is applied, therefore a second person is necessary for this operation.

7.4.4 The derrick foot should not rise more than 6 inches off the ground. If the derrick foot lifts, release the PROBE control. This will return the derrick foot to its original position.

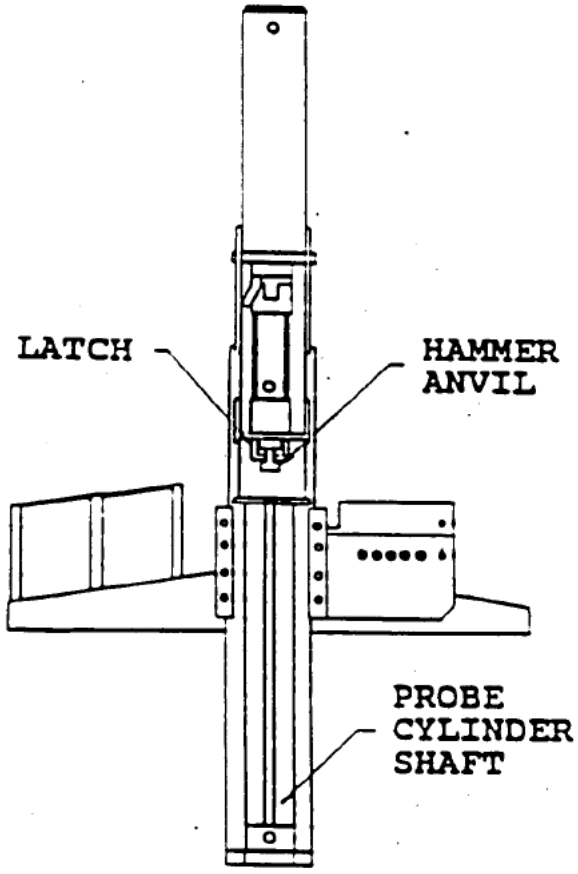
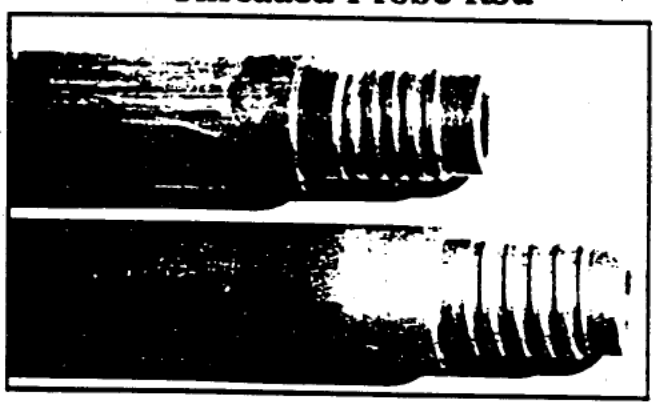


FIGURE 7.3.1 HAMMER LATCH AND HAMMER ANVIL

Geoprobe Drive Cap
Part No. AT-11B
Threaded top cap for driving Geoprobe brand probe rod.

AT-11B

Threaded Probe Rod



Older "A" style thread (top)
Improved "B" style thread (bottom)

FIGURE 7.3.2 DRIVE CAP AND PROBE RODS

7.4.5 The FOLD control may be used to maintain a 90° angle as the derrick foot is raised off the ground.

7.5 PROBING: DRILLING

Hearing and eye protection must be worn when drilling.

7.5.1 Position the probe at the desired sampling location as described in Section 7.1.

7.5.2 Position the ELECTRICAL control switch for the hydraulics to "off" and insert the drill steel with carbide-tipped bit into the hammer.

7.5.3 Activate the HAMMER ROTATION control by turning the knob counter-clockwise (Figure 7.5.1). This allows the drill bit to rotate when the HAMMER control is pressed.

7.5.4 Press down on the HAMMER control and periodically depress the PROBE control to lower the probe incrementally. The HAMMER control must be kept fully depressed during drilling.

7.5.5 If the drill stops rotating, raise the probe slightly with the PROBE control lever until the drill rotates, and then continue drilling.

7.5.6 When the drill has reached soil, release the HAMMER control, turn the HAMMER ROTATION control knob clockwise to deactivate rotation, and retract the rod as described in Section 7.7. Remove the drill steel and continue probing as described in Sections 7.4 and 7.6. The drill can be used to penetrate up to two feet of asphalt, concrete, or hard soils.

7.6 PROBING: ADDING RODS

7.6.1 Turn off the ELECTRICAL control switch for the hydraulics.

7.6.2 Remove the drive cap from the probe rod that is in the ground. Turn on the hydraulics and lift the probe cylinder to its maximum height. Turn the hydraulics off.

7.6.3 Screw the drive cap onto the probe rod to be added. Screw this probe rod to the probe rod already in the ground.

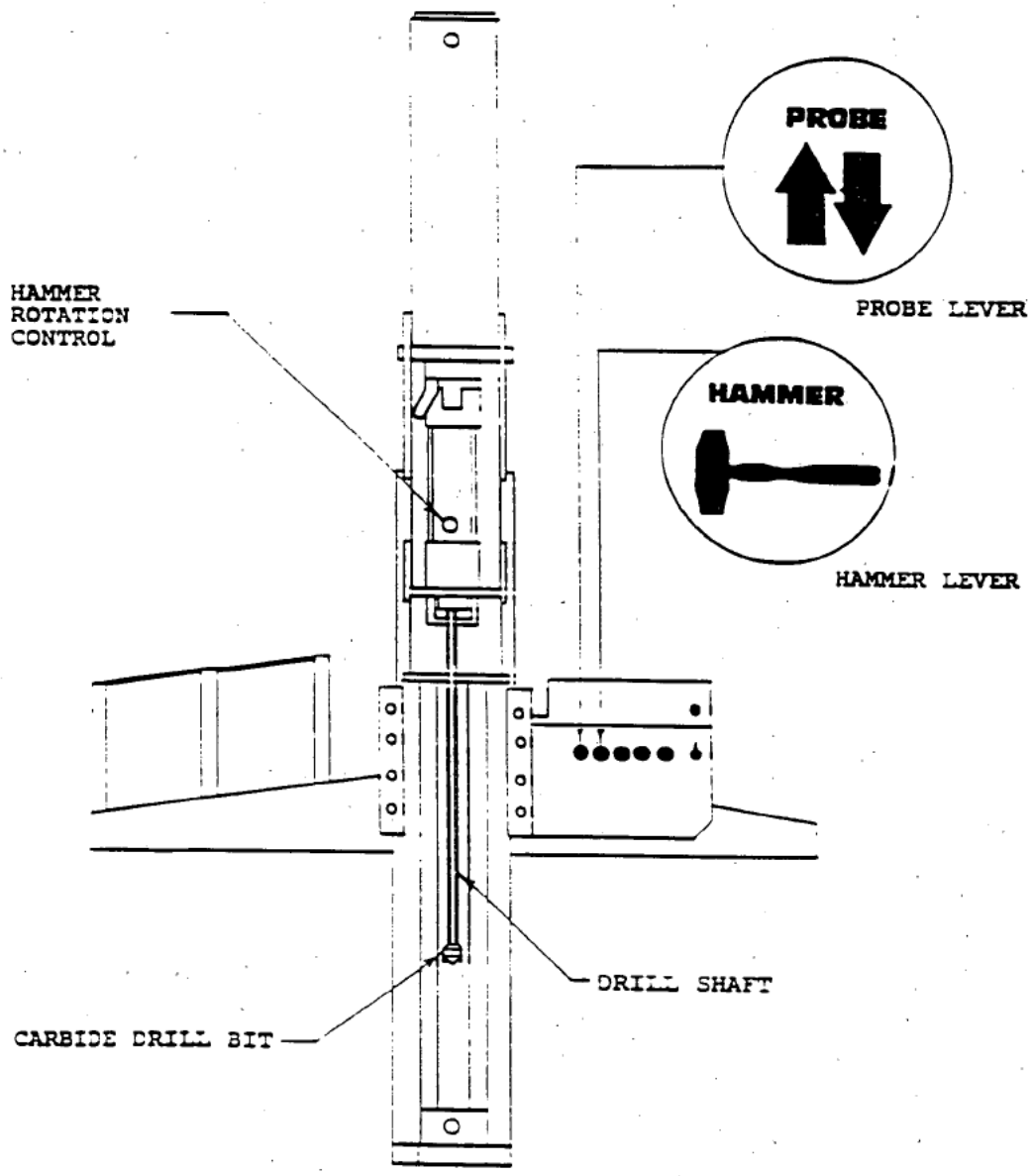


FIGURE 7.5.1 HAMMER ROTATION CONTROL KNOB

7.6.4 Continue this procedure until the desired sampling depth is reached. A sampling log that indicates the number and length of each rod used, the sampling equipment used, and the depth at which sample collection begins and ends should be kept by operators.

7.7 PROBING: PULLING RODS

7.7.1 Turn off the hydraulics.

7.7.2 Lift the hammer latch and remove the hammer anvil.

7.7.3 Replace the drive cap on the extruding probe rod with the pull cap.

7.7.4 Lift up the hammer latch, activate the hydraulics, lower the hammer to the pull cap, and close the hammer latch over the pull cap (Figure 7.7.1).

7.7.5 Retract the probe rod by holding up the PROBE control lever. The probe cylinder should not be lifted to its full height. Lower the probe cylinder slightly to release the pressure on the hammer latch, raise the latch, remove the pull cap from the rod, and remove the top rod. Repeat this procedure with any remaining rods.

7.8 SAMPLE COLLECTION: SOIL VAPOR

7.8.1 Assemble a probe rod with a PRT retractable or expendable point system.

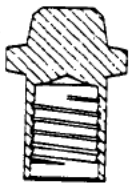
7.8.2 Advance the probe to desired sample depth according to the procedures in Sections 7.3 and 7.4.

7.8.3 Using a pull cap, retract the probe rod approximately 6 inches.

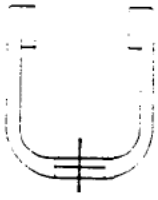
7.8.4 Assemble a PRT tubing adapter with sufficient length of teflon tubing, lower the assembly into the probe rods, and install the adapter by rotating the tubing counter-clockwise until the threads have tightened (Figure 7.8.1). PRT tubing adapters have reverse threads.

7.8.5 Collect samples by following the procedures in FASP SOP F93012, "Collection of Gaseous Samples by Using Tedlar Bags."

Geoprobe Pull Cap
Part No. AT-12B
Female threaded for pulling Geoprobe probe rods. Hammer latch fits over flanged top. Not required when using manual probe rod jack.



AT-12B



RP-25

GSK-58 Hammer Latch
Part No. RP-25
Replacement hammer latch. Fits GSK-58 Hammer on Geoprobe 8-M model machines.

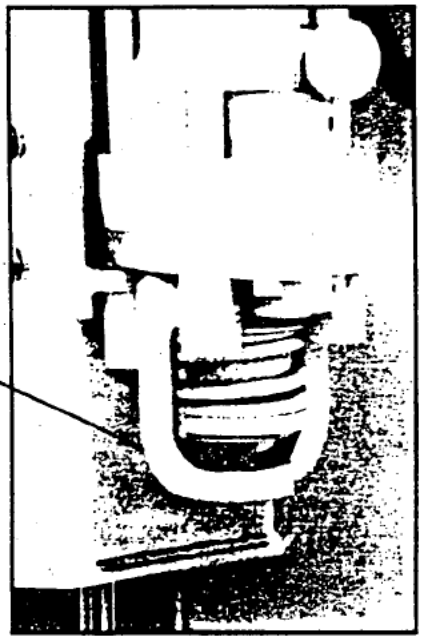


FIGURE 7.7.1 HAMMER LATCH AND PULL CAP

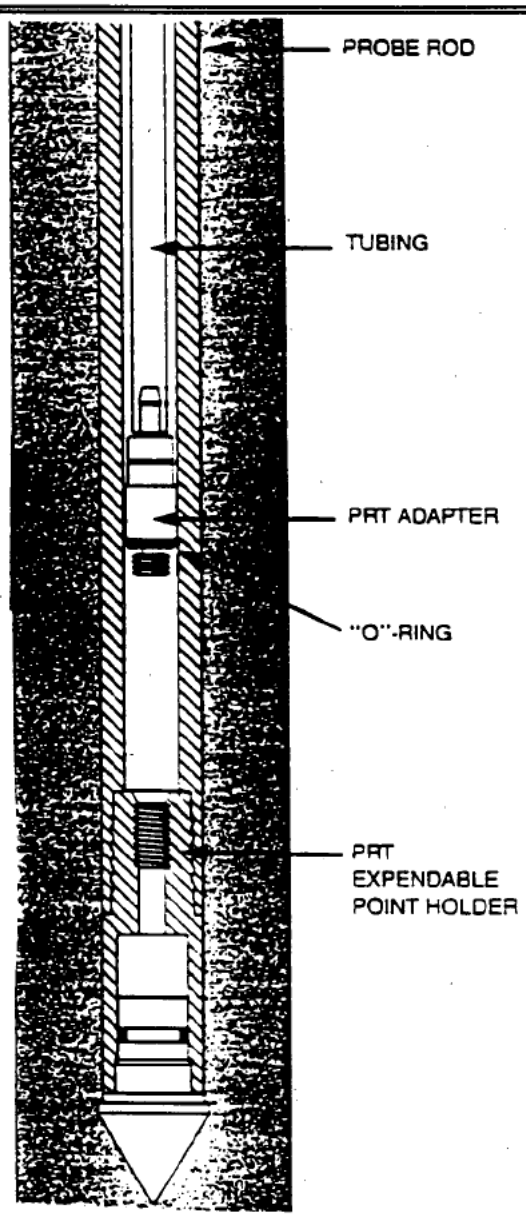


FIGURE 7.8.1 PRT SOIL GAS ADAPTER AND EXPENDABLE POINT

7.9 SAMPLE COLLECTION: SOIL CORE

7.9.1 Large Bore Sampler: The piston tip is screwed onto the piston rod. The acetate liner is hand-flared and attached to a cutting-shoe. The piston rod is placed into the acetate liner, with the piston tip flush within the cutting-shoe. This assembly is placed into the sample tube, the cutting-shoe and drive head are screwed into the sample tube, and the stop-pin is screwed into the drive head. This sampler is used when large volumes are needed or visual examination of core is required (Figure 7.9.1).

7.9.2 The assembled sampler is attached to the leading probe rod. It is then driven using standard probe procedures, described in Sections 7.3 and 7.4, to the top of the interval to be sampled. Under some circumstances, the hole may be pre-probed using a retractable drive point.

7.9.3 To remove the piston tip from the drive head, retract the probe unit from the probe rod, remove the drive cap from the last probe rod, and lower the extension rod inside the probe rods. Rotate the extension rod clockwise until the leading extension rod is screwed into the stop-pin. Continue to rotate clockwise until the stop-pin is removed from the drive head. Removing the stop-pin from the sampler will allow the piston to move up when the sampler is driven down. Remove the extension rod and the attached stop-pin.

7.9.4 Replace the drive cap on the last probe rod and mark the rod with an indelible pen at the appropriate distance above the ground surface for sample collection.

7.9.5 Drive the probe rod the designated distance. Retract the probe rods as described in Section 7.7.

7.10 SAMPLE COLLECTION: GROUNDWATER

7.10.1 Position the Geoprobe as described in Section 7.1.

7.10.2 Groundwater is collected using a mill-slotted assembly (Figure 7.10.2). This assembly screws onto the leading probe rod. The mill-slotted rod section is cut with slots 2 inches long by 0.020 inches wide. This section is fitted with a mill slot drive head and solid drive point. The mill-slotted rod section is open to the soil as it is driven to the desired sample depth.

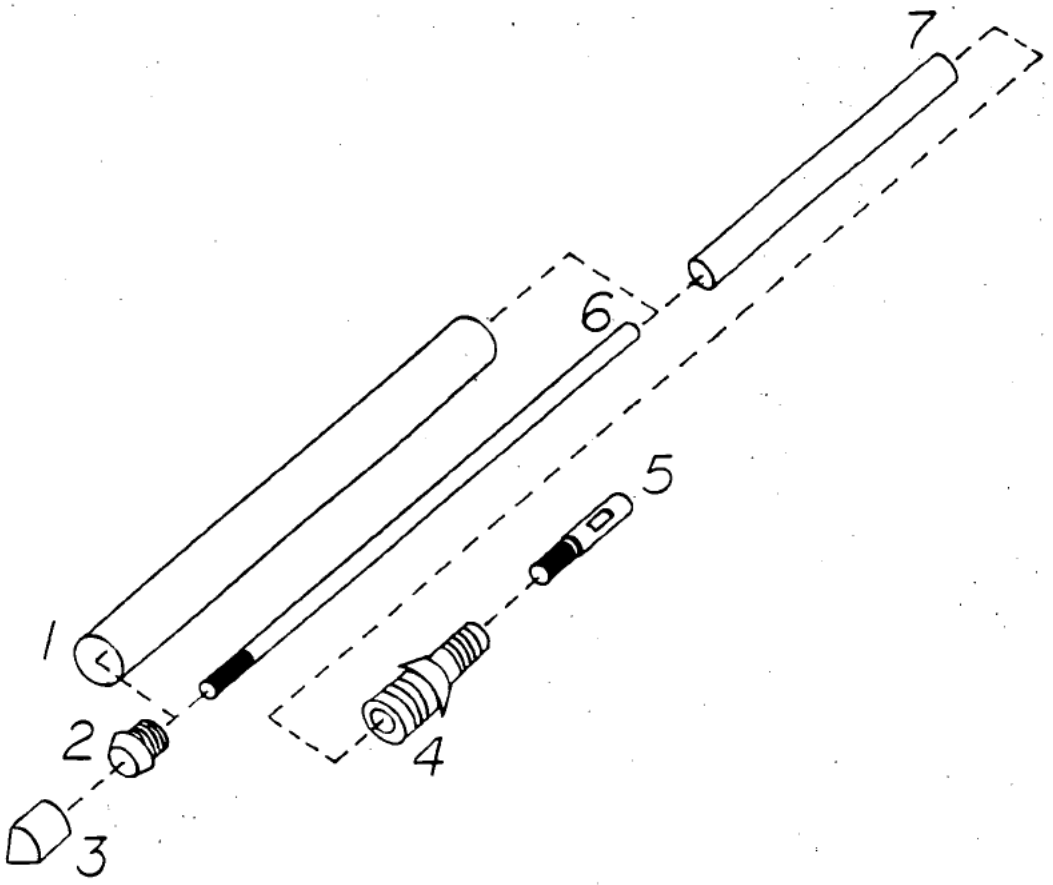
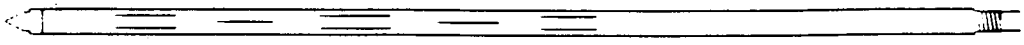


FIGURE 7.9.1 LARGE BORE SOIL SAMPLER

(1) Sample Tube, (2) Cutting-Shoe, (3) Piston Tip, (4) Drive Head, (5) Stop-Pin, (6) Piston Rod, and (7) Acetate Liner.

Mill-Slotted Well Point
Part No. GW-43K
Threads into leading Geoprobe probe rod. 3' length x 1" O.D.
Has 15 mill-cut slots. each 2" in length x .020" in width.



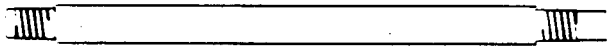
GW-43K
(Assembled Sampler)

Sub Assembly Parts

Solid Drive Point
Part No. AT-142B

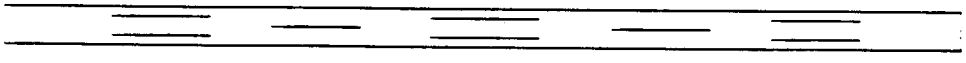
AT-142B

Mill Slot Drive Head
Part No. GW-43B



GW-43B

Mill-Slotted Rod Section
Part No. GW-44



GW-44

FIGURE 7.10.2 COMPLETE MILL-SLOTTED GROUNDWATER SAMPLER ASSEMBLY

7.10.3 The sampler is driven into the water-bearing formation, and the probe is retracted two feet as described in Section 7.7.

7.10.5 Remove the drive cap. Groundwater samples are collected in polyethylene tubing converted into a mini-bailer by attachment of a tubing bottom check valve. This mini-bailer is filled by submergence in groundwater and by either gentle manual vertical oscillation or by using an oscillation pump (Figure 7.10.3). The mini-bailer can either be raised full of water and the sample collected or, if the sample is collected in the mini-bailer near the ground surface, the vertical oscillation of the tubing may pump water to the surface.

8.0 DECONTAMINATION

8.1 New lengths of polyethylene tubing should be used for each sample. If decontamination is necessary, rinse tubing with methanol or hexane, a non-phosphate detergent, and organic free water, and allow to air dry.

8.2 All Geoprobe sampling tools, including probe rods, should be decontaminated by steam-cleaning or by the procedures in Section 8.1. All probe rods should be steam-cleaned before initial use and between use at each sample location.

9.0 SAFETY

Health and Safety equipment is listed in Section 6.5.

9.1 Always place the vehicle transmission in park and set the emergency brake before engaging the remote ignition.

9.2 The rear of the vehicle should not be fully raised with the probe foot, as the vehicle may fall or move, causing injury.

9.3 Always extend the probe unit out from the vehicle and deploy the foot to clear the vehicle ceiling before folding the probe unit out.

9.4 Operators should wear OSHA-approved steel-toed boots and keep feet clear of the probe foot.

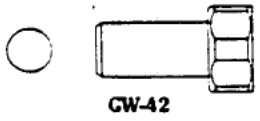
9.5 One person should operate the Geoprobe hydraulics while another handles probe rods and accessories.

9.6 Never place a hand on top of a rod while the probe is being lowered.

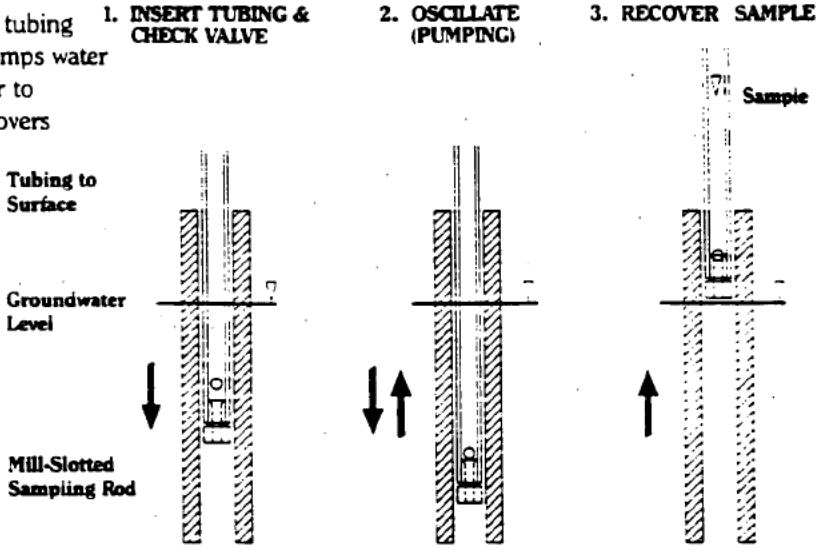
Tubing Bottom Check Valve

Part No. GW-42

Fits ¼" I.D. Tubing. Converts standard tubing into a mini-bailer. Oscillating motion pumps water column up into tubing. Can pump water to surface in some formations. Tubing recovers 9.65 ml per foot.



Groundwater Sampling With Tubing Bottom Check Valve



Check Balls

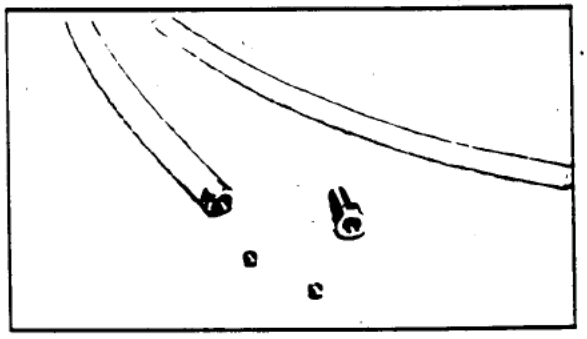
Part No. GW-42-1

Replacement check balls for GW-42. Package of 25.

¼" I.D. Polyethylene Tubing

Part No. TB-25L

⅜" O.D. x ¼" I.D. .060" wall tubing. For water sampling with GW-42 tubing bottom check valve. Discard tubing after each sample. 500 ft. roll.



Tubing Bottom Check Valve and ⅜" Polyethylene Tubing

FIGURE 7.10.3 MINI-BAILER USED FOR GROUNDWATER SAMPLE COLLECTION

9.7 Turn off the hydraulic system before changing rods, inserting the hammer anvil, or attaching accessories.

9.8 The operator must stand to the control side of the probe machine, clear of the probe foot and mast.

9.9 Wear safety glasses at all times during the operation of the Geoprobe.

9.10 Never exert down pressure on a probe rod so as to lift the rear tires of the vehicle off the ground.

9.11 Never exert down pressure on a probe rod so as to lift the rear of the vehicle over six inches off the ground.

9.12 Always remove the hammer anvil or other tool from the machine before folding the machine to the horizontal position.

9.13 The vehicle catalytic converter is hot and may present a fire hazard when operating over dry grass or other combustibles.

9.14 Geoprobe operators must wear ear protection. OSHA approved ear protection for sound levels exceeding 85 dba is recommended.

9.15 The location of buried or underground utilities and services must be known before starting to drill or probe.

9.16 Shut down the hydraulic system and stop the vehicle engine before attempting to clean or service the equipment.

APPENDIX E

Health and Safety Plan

for the

Montrose Chemical Superfund Site

Submitted to

U.S. Environmental Protection Agency
Field Operations Branch
Site Evaluation Section
75 Hawthorne Street
San Francisco, California 94105

June 17, 1994

Prepared by

Environmental Services Assistance Team (ESAT)
ICF Kaiser International, Inc.
160 Spear Street, Suite 1380
San Francisco, California 94105-1535

TID # 09-9403-447

1.0 GENERAL INFORMATION

This Health and Safety Plan (HSP) was prepared for ICF Kaiser International, Inc., ESAT Region 9, Field Analytical Services Program (FASP) sampling activities near the Montrose Chemical Superfund Site between June 27 and July 8, 1994. Sampling operations are expected to be of low hazard and will require Levels C and D personnel protection.

2.0 BACKGROUND

2.1 Site Location and Description

The study area is located adjacent to the Del Amo Superfund site between Del Amo Boulevard and 204th Street, and between the northern extensions of Budlong and Berendo Avenues in the City of Torrance, Los Angeles County, California. The Montrose Chemical Superfund site is located at the junction of Del Amo Boulevard and Normandie Avenue, approximately 1500 feet from the study area. The study area covers approximately 2.3 acres and consists primarily of residential properties and undeveloped public lands. The perimeter of the study area consists of residential properties, concrete sidewalks and asphalt that extend along the length of 204th Street, and pavement and undeveloped lands that extend along the length of Del Amo Boulevard.

2.2 Site History

According to aerial photographs, the study area consisted of a natural drainage that flowed in a southerly direction. This drainage was filled between 1953 and 1956, and structures were built over the fill material between 1956 and 1972. The fill material at the site may be related to two former industrial facilities located near the study area, the Montrose Chemical facility and the Del Amo rubber manufacturing facility.

Previous soil investigations in the study area indicated elevated levels of dichlorodiphenyltrichloroethane (DDT) in the backyards of residences overlying the fill area. The CH2MHILL February investigation indicated that DDT concentrations ranged from 231 to 606 parts per million (ppm) in three 20 ft. by 20 ft. grid squares out of a total of 36 grid squares. Samples from the remaining grid squares exhibited DDT concentrations ranging from 0.1 to 45.3 ppm. Samples which represent these concentrations were collected at a depth of six inches. Eight samples collected by Ecology and Environment from 1, 2, and 3 foot depths during the March investigation indicated DDT concentrations ranging between 0.01 to 2880 ppm, and 4509 ppm for total DDT, which includes DDT, dichlorodiphenyldichloroethane (DDD), and dichlorophenyldichloroethylene (DDE). Soils have been excavated down to seven feet deep over portions of the backyard areas of 1051 and 1055 204th Street since the March investigation. In addition, according to EPA, previous investigations indicated elevated levels of chlorobenzene in the backyards of residences overlying the fill area.

3.0 EMERGENCY PROCEDURES

Apply the necessary first aid if trained properly. Call 911 and/or other appropriate emergency numbers to report an emergency. When calling for emergency assistance, provide the following information to the response agency:

- Name of person making the call
- Telephone number you are calling from and your location
- Nature of the emergency and the type of assistance needed
- Actions already taken
- Other response agencies notified
- Name of any persons injured or exposed
- Chemicals (agents) involved, if known

Follow any instructions given by the appropriate agency. Notify the Health and Safety Officer (HSO) and/or ESAT Team Manager (ETM) when the situation is under control.

4.1 Emergency Telephone Numbers

- Police, Fire or Medical Aid 911

- ICF Kaiser International, Inc.-ESAT Staff:
  - Jerry Vail (office) . . . . . (415) 882-3026
  - Jerry Vail (home) . . . . . (415) 824-7297
  - Dan Rodoni (office) . . . . . (415) 882-3043
  - Dan Rodoni (home) . . . . . (415) 334-2524
  - Andy Peters (office) . . . . . (703) 934-3887
  - Andy Peters (home) . . . . . (301) 916-0014
  - Andy Peters (pager) . . . . . (202) 996-4704
  - Jerry Joy (office) . . . . . (412) 497-2056
  - Jerry Joy (home) . . . . . (412) 672-7782
  - Jerry Joy (pager) 1-800 759-7243

  Enter the number "5449709" for Jerry Joy's pager. Then press #, enter the telephone number where you can be reached, press #, listen to confirm, and press #.

- EPA Health and Safety Staff:
  - Richard Taft (office) . . . . . (415) 744-1606
  - Denise Wallace (office) . . . . . (415) 744-1607

- **Poison Control Center: 24 Hour Hotline** 1-800-523-2222

- Nearby Hospital: **Harbor General Hospital** . . . . . (310) 222-2345
  Route - Travel approximately 0.10 mile east on Del Amo Boulevard from the site to Vermont Avenue and 1.1 miles south on Vermont Avenue to the hospital, which is located at the junction of West Carson Street and Vermont Avenue (Figure A-1).

  Approximate Travel Time: < 5 Minutes Approximate Miles: 1.2

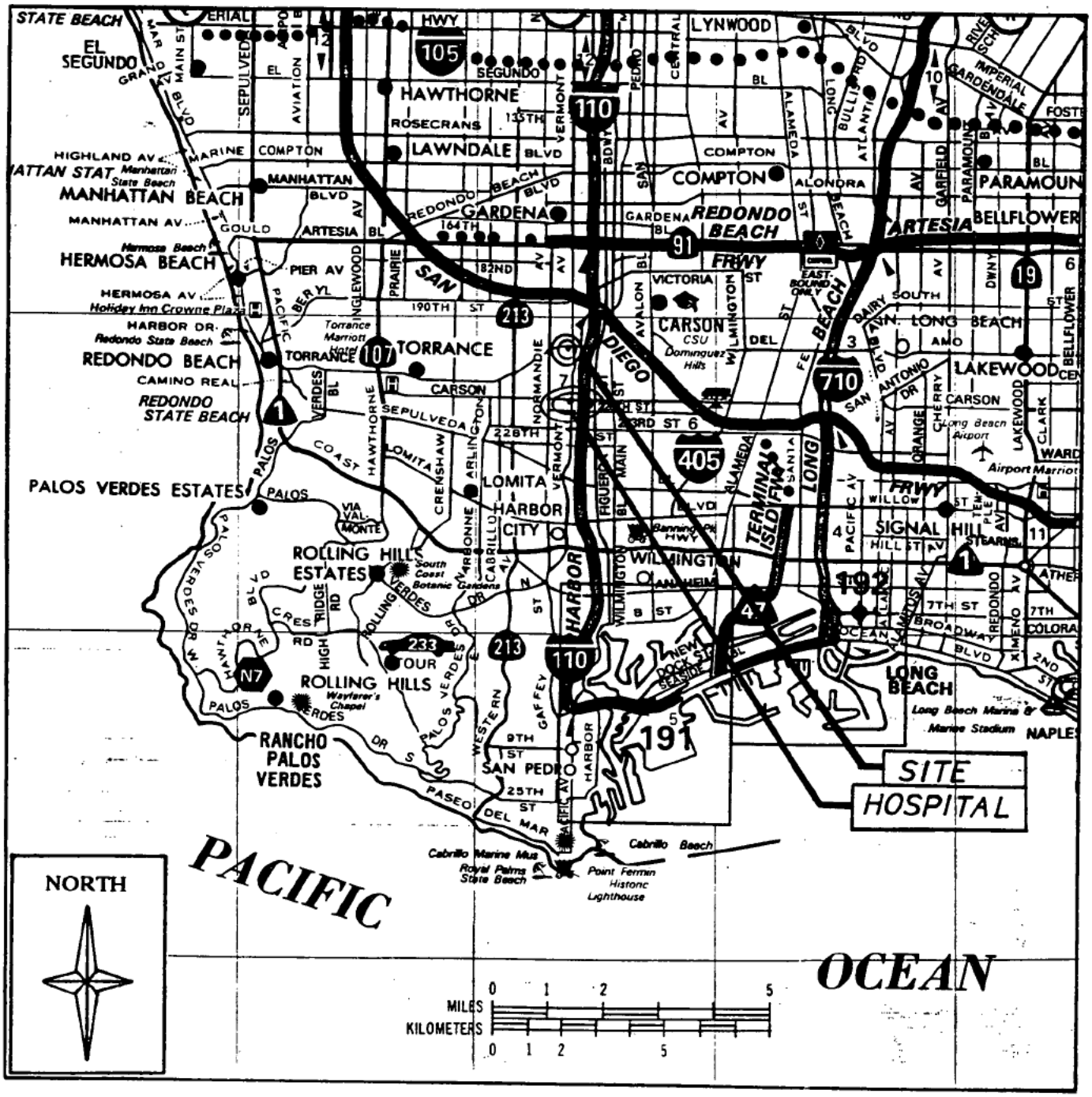


Figure A-1 - Map showing locations of site and hospital.
(Open Ellipses = Hospital Location)
(Open Circles = Site Location)

5.0 CHEMICAL HAZARDS OF CONCERN

Two types of chemicals may be found on site, chlorinated volatile organic compounds (VOCs), and dichlorodiphenyltrichloroethane (DDT) and it's isomers and degradation products. Past sampling efforts indicate that most chlorinated VOCs are present at low levels in groundwater near the site and that DDT is present in soils at depths between 2 and 3 feet below ground surface. Exposure to these chemicals should be limited because groundwater wells will not be sampled during site activities and because limited dust is expected to be produced during site activities. Properties of these chemicals are given below.

Properties

Chlorinated Volatile Organic Compounds

Exposure Limits: approximately 25 ppm (time weighted average for 10 hour day)
Physical Description: Colorless gases with a chloroform like odor
Chemical Incompatibilities: Strong caustics and alkalis, chemically active metals
Health Hazards: Inhalation; headache, vertigo; Ingestion, tremors, nausea; contact, eye irritation, dermatitis, vomiting
Safety Procedures: Eye, irrigate immediately; Skin, soap, wash promptly; Breathing, respiratory support; Swallow, medical attention immediately

Dichlorodiphenyltrichloroethane (DDT)

Exposure Limits: 1 mg/m^3 (Permissible Exposure Limit)
Physical Description: DDT is a colorless to off-white powder with a slight aromatic odor. DDT is a contact insecticide that is currently banned from usage in the United States. It is noncombustible and is insoluble in water.
Health Effects: acute effects of DDT exposure are primarily related to skin and respiratory irritation and nervous system effects. Symptoms of acute exposure include eye irritation, excessive perspiration, dizziness, nausea, vomiting, convulsions, headache, fatigue, increased salivation, tremors, accelerated heartbeat, and cyanosis of the lips. Chronic exposure may result in a significant risk of bioaccumulation of DDT in adipose tissue, which may have the potential to produce delayed ill effects. Liver injury and possible carcinoma are the primary hazards of chronic exposure. Repeated or prolonged skin contact with DDT results in skin irritation.
Safety Procedures: Eye, irrigate immediately; Skin, soap, wash promptly; Breathing, respiratory support; Swallow, medical attention immediately

5.1 Standard Treatments

5.1.1 Splashes to the Skin

1. Flood the splashed surface thoroughly with large quantities of running water and continue for at least 10 minutes, or until satisfied that no chemical remains in contact with the skin. Removal of agents insoluble in water will be facilitated by cleaning the contaminated skin area with soap.
2. Remove all contaminated clothing, taking care not to contaminate yourself in the process.
3. If the situation warrants it, arrange for transport to hospital or refer for medical advice to the nearest doctor. Provide information of the chemical responsible to accompany the casualty with brief details of the first aid treatment given.

5.1.2 Splashes to the Eye

1. Flood the eye thoroughly with large quantities of gently running water either from a tap or from one of the eyewash-bottles provided and continue for at least 10 minutes.
2. Ensure the water bathes the eyeball by gently pressing open the eyelids and keeping them apart until the treatment is completed.
3. All eye injuries from chemicals require medical advice. While giving treatment arrange transport to hospital and supply information to accompany the casualty on the chemical responsible with brief details of the treatment already given.

5.1.3 Inhalation of Gases

1. Remove the casualty out of the danger area after first ensuring your own safety.
2. Loosen clothing.
3. If the casualty is unconscious place in a face-down position and watch to see if breathing stops.
4. If breathing has stopped supply artificial respiration by the mouth-to-mouth method.
5. If the emergency warrants it, remove the patient to hospital and provide information on the gas responsible with brief details of the first aid treatment given.
6. Administer oxygen if available and if the casualty's condition is serious.

5.1.4 Ingestion of Poisonous Chemicals

1. If the chemical has been confined to the mouth give large quantities of water as a mouth wash. Ensure the mouth wash is not swallowed.
2. If the chemical has been swallowed give about 250 ml (4.2 ounces) of water to dilute it in the stomach.
3. Do not induce vomiting as a first aid procedure.
4. Arrange for transport to hospital. Provide information to accompany the casualty on the chemical swallowed with brief details of the treatment given and if possible an

estimate of the quantity and concentration of the chemical consumed and the time elapsed since the emergency occurred.

6.0 PHYSICAL HAZARDS OF CONCERN

The potential physical hazards that are associated with this project include those of outdoor work, such as falling, slipping, and tripping. Performing physical activities outdoors may present a risk of developing symptoms of heat-related illness for those who are susceptible. These items are low-probability events with high severity of injury. Both low-probability events and those to which workers are more or less continuously exposed can be avoided with the use of common sense and proper vigilance to the task being performed, and to the conditions of the site.

6.1 Falling, Tripping, and Slipping

The site may contain various types of equipment or man-made and natural hazards that can pose falling, tripping, and slipping hazards. Some of the sampling locations within the Nobel Properties site consist of soil piles. Careful attention should be taken when walking through the site to prevent slips, trips, and falls.

6.2 Heat Stress

Heat stress may be a hazard during hot weather and may be intensified when a worker is required to wear protective clothing. The sampler will be required to take breaks, as needed, to prevent heat stress and will consume adequate quantities of liquid. Heat-related problems are discussed below:

- **Heat Rash.** Heat rash is caused by continuous exposure to heat and humid air and is aggravated by chafing caused by clothing. In addition to being painful, this condition decreases the body's ability to tolerate heat.

- **Heat Cramps.** Heat cramps are painful spasms that occur in the skeletal muscles of workers who sweat profusely and drink large quantities of water but fail to replace the body's lost salts, or electrolytes. Drinking water while continuing to lose salts tends to dilute the body's extracellular fluids. Water seeps into active muscles by osmosis and causes pain. Muscles fatigued from work are usually the most susceptible to cramps. Treatment includes increasing salt consumption by adding salt to food, or by drinking commercially available preparations that provide the proper balance of water and salts, such as Gatorade. Salt tablets should be avoided.

- **Heat Exhaustion.** Heat exhaustion is characterized by extreme weakness and fatigue, dizziness, and headache. In serious cases, a person may vomit or lose consciousness. The skin becomes clammy and moist and the complexion pale or flushed. The body

temperature is normal or slightly elevated. Treatment consists of rest in a cool place and replacement of body water lost by perspiration. Persons with mild cases may recover spontaneously with this treatment; sever cases may require care for several days. There are no permanent affects from heat exhaustion..

- **Heat Stroke.** Heat stroke is a very serious condition caused by the breakdown of the body's heat-regulating mechanism. The skin becomes very dry and hot and appears red, mottled, or bluish. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, heat stroke can cause death or permanent brain damage. Medical assistance must be sought immediately for heat stroke cases. First aid treatment includes moving the person to a cool place. Body heat should be reduced artificially, but not too rapidly, by soaking the person with water and fanning him/her. Plain water is an excellent rehydrator and should be served cool, but not cold (50° to 60°F). Water will be available at the site.

7.0 MEDICAL SURVEILLANCE

All ESAT personnel required to perform on-site tasks are enrolled in the ICF Kaiser International, Inc. Medical Monitoring Program. These personnel are subjected to baseline and annual examinations. Medical clearance forms signed by occupational health physicians will be kept in ESAT Health & Safety files by the HSO.

8.0 TRAINING REQUIREMENTS

All ESAT personnel required to perform on-site activities have attended 40 hour Hazardous Waste Operations and Emergency Response training courses and appropriate 8 hour refreshers as outlined in 29 CRF 1910.120(e). These personnel have current respirator fit-test and first aid certifications.

ESAT personnel will review this HSP prior to on-site activities and will conduct an initial Site Safety Meeting (SSM) and daily SSMs if conditions vary on a daily basis at the site. Documentation of training topic(s) covered, instructors name, and personnel attendance will be recorded in the site log book. A photocopy of this documentation will be provided to the ESAT HSO.

9.0 PERSONAL PROTECTIVE EQUIPMENT

Sampling activities at the site will require Level C and Level D protection. Level C protection will be necessary for personnel during drilling operations with the gas-powered auger. The potential for DDT in dust may exist during gas-powered augering operations. Level D protection will be necessary for personnel during Geoprobe® and hand augering

drilling operations, during immunoassay field testing, and during decontamination activities. Level D is used when toxic substances are known and field activities present no potential for significant airborne exposure.

A full face Air Purifying Respirator (APR) with MSA GMA-H Cartridges must be used during Level C operations. Table 9-1 lists PPE that must be worn during Level C and D operations at the site.

TABLE 9-1
PERSONNEL PROTECTIVE ENSEMBLE

Work Location	Job Function	Level	Respiratory	Face	Skin (Outer)	Skin (Inner)	Other
On-site/ Off-site	Subsurface Sampling with gas-powered auger	Level C	Full Face Air Purifying Respirator & MSA GMA-H Cartridge		Nitrile Gloves; Tyvek Suit and work gloves	Latex Gloves; personal clothing	Hard Hat and Steel-toed Boots
On-site/ Off-site	Subsurface sampling with Geoprobe and hand auger; Immunoassay field testing; Equipment rinsate blank collection	Level D		Safety Glasses	Nitrile Gloves; Tyvek and work gloves for drilling operations; personal clothing for immunoassay field testing and decontamination procedures	Latex Gloves	Hard Hat and Steel-toed Boots for drilling operations

10.0 MONITORING PROGRAM

An exclusion zone will be demarcated around each gas-powered augering location. A direct readout dust monitor will be utilized during drilling operations in these exclusion zones. In the event that dust levels exceed 0.05 mg/m ^{3} per minute at the perimeters of these exclusion zones, drilling activities will cease and the exclusion zones will be broadened until perimeter dust levels drop below 0.05 mg/m ^{3}. If the exclusion zones cannot be broadened, a sample will not be collected at that location.

11.0 SITE CONTROL MEASURES

Site work zones, including control zones, a decontamination zone and exclusion zones will be properly demarcated by ESAT to ensure adequate site control.

12.0 COMMUNICATIONS AND EMERGENCY ALARM SYSTEM

Repetitive short blasts on a vehicle horn or by an air horn will indicate the need for immediate site evacuation.

13.0 DISPOSAL OF RESIDUAL MATERIAL

Different types of potentially contaminated investigation-derived wastes (IDW) will be generated at the site. Disposal procedures outlined in the ESAT FSP will be used for all IDW generated at the site.

14.0 DECONTAMINATION PROCEDURES

Sampling equipment will be decontaminated by ESAT in accordance with the ESAT FSP.

15.0 REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH), 1991, Guide to Occupational Exposure Values-1991, ACGIH, Cincinnati, Ohio, ISBN: 0-936712-94-5, 136 p.

Bretherick, L., 1981, Hazards in the Chemical Laboratory; London, The Royal Society of Chemistry, Third Edition, 567 p.

National Institute for Occupational Safety and Health (NIOSH), 1990, NIOSH Pocket Guide to Chemical Hazards; U.S. Department of Health and Human Services (DHHS), Public Health Service, Centers for Disease Control, NIOSH, DHHS (NIOSH) Publication No. 90-117, 245 p.

APPENDIX F

CLP Paperwork Instructions

C F KA S ER
ENVIRONMENT & ENERGY GROUP

ICF Kaiser Engineers, Inc.
160 Spear Street, Suite 1380
San Francisco, CA 94105-1535
415/882-3000 Fax 415/882-3199

MEMORANDUM

DATE: June 6, 1994

TO: Samplers Shipping to EPA Region 9 Lab for Saturday Delivery

FROM: Caron Sontag, ESAT RSCC Coordinator
CS.

SUBJECT: Special Instructions for Saturday Deliveries to EPA Region 9 Lab

If samples are being shipped to the EPA Region 9 Laboratory in Richmond, California for Saturday delivery, please be sure to complete the following items:

1.) Mark the Federal Express airbill "hold for pick-up" (section 5 of the airbill).

2.) In section H of the airbill print the following Federal Express office address:

1600 63rd Street
Emeryville, CA 94608

3.) In section 2 of the airbill use the following telephone number:

(415) 412-2315

4.) Call in shipping information to ESAT RSCC by noon on Friday.

If you have any additional questions regarding these instructions please contact the ESAT RSCC Coordinator at (414)882-3069.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

January 28, 1994

MEMORANDUM

SUBJECT: Requesting Dissolved Metals from CLP Laboratories

FROM: Rich Bauer, Regional Sample Control Coordinator
Quality Assurance Management Section (P-3-2)

TO: All Region IX CLP Users

It has come to my attention that some CLP laboratories are analyzing samples designated for "dissolved metals" without digesting the samples prior to analysis. The CLP Statement of Work (SOW) for Inorganic Analysis states that "if dissolved metals are requested by the EPA Regional offices, the Contractor (laboratory) shall follow the instructions provided on the Traffic Reports. If there are no instructions on the Traffic Report, the Contractor shall contact the Sample Management Office (SMO) for resolution".

Many of the Traffic Reports submitted by samplers working within Region IX do not specify whether or not the laboratory is to perform a digestion on samples designated for dissolved metals, and some of the laboratories have neglected to contact SMO, and have simply assumed that digestion is not necessary. The effect on data comparability of having some samples digested and some analyzed without digestion is not clear, and is probably site specific. It is possible that the consequences may be significant. While it is the laboratory's contractual obligation to resolve this issue before they begin work, it would simplify matters greatly if the laboratory received clear instructions in the first place. **Therefore, Region IX samplers submitting samples to CLP laboratories for dissolved metals analysis must clearly indicate on the Inorganic Traffic Report whether or not the laboratory is to digest the samples prior to analysis.**

If you have any questions regarding this issue please call me at (415) 744-1499.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

September 28, 1993

MEMORANDUM

SUBJECT: Sample Cooler Return Shipping from CLP Laboratories

FROM: Rich Bauer
Region IX Sample Control Center Task Monitor

TO: All CLP Laboratory Users in Region IX

Until June 1, 1993, sample coolers used to ship samples to laboratories participating in the EPA Contract Laboratory Program (CLP) were sent back to samplers under a nationwide shipping account administered through EPA headquarters. This service is no longer available. CLP users must now provide laboratories with a means to return coolers to their place of origin. **CLP laboratories are not responsible for cooler return shipping costs.** In other words, if you do not provide laboratories with return shipping instructions and your own account number to charge shipping costs to, your coolers are likely to spend a considerable amount of time languishing in "cooler limbo" before shipping arrangements are worked out.

Samplers using EMFAC coolers should refer to Section 7 of the EMFAC Users Guide for cooler return instructions.

For further information you may contact me at (415) 744-1499. EPA contractors should contact their EPA Project Officer for details on acceptable modes of cooler return shipping and shipping cost reimbursement. Happy sampling!

INSTRUCTIONS FOR

SAMPLE SHIPPING

AND DOCUMENTATION

January 1994

Quality Assurance Management Section
U. S. EPA Region 9
San Francisco, CA

Prepared by:

Gail Jones
ESAT/ICF Technology, Inc.
San Francisco, CA

TABLE OF CONTENTS

1.0 GENERAL

1.1 When all paperwork has been completed by the sampler and samples are ready to be shipped, place the laboratories' copies in a plastic bag and tape it to the inside of the lid of the cooler(s). Sample Management Office's (SMO) copies must be submitted within 5 days of sampling. The Region's copies may be submitted at that time or at the end of the sampling event. If the sampling event covers an extended length of time, the Region's copies must be submitted weekly. (Note: The ESAT RSCC coordinator will not forward SMO's copies. They will be returned to the sampler.)

QAMS address:

U.S. EPA Region 9
Quality Assurance Management Section (P-3-2)
75 Hawthorne Street
San Francisco, CA 94105
Attn: RSCC Coordinator

SMO address:

Sample Management Office
P. O. Box 818
Alexandria, VA 22313
Attn: Region 9 Coordinator

1.2 For analyses performed by the Regional Laboratory, DO NOT send any copies of the paperwork to the Sample Management Office (SMO). Send both the Regional and SMO copies to the USEPA Region 9 Quality Assurance Management Section.

1.3 DISTRIBUTION OF COPIES

1.3.1 ORGANIC TRAFFIC REPORT/CHAIN-OF-CUSTODY FORM

a. Blue (original) copy to QAMS, Region 9
b. Pink (second) copy to SMO
c. White (third) and Yellow (fourth) copies accompany samples to laboratory
d. Photocopy for sampler's files

1.3.2 INORGANIC TRAFFIC REPORT/CHAIN-OF-CUSTODY FORM

a. Green (original) copy to QAMS, Region 9
b. Pink (second) copy to SMO
c. White (third) and Yellow (fourth) copies accompany samples to laboratory
d. Photocopy for sampler's files

1.3.3 SAS PACKING LIST/CHAIN-OF-CUSTODY FORM

a. White (original) copy to QAMS, Region 9
b. Yellow (second) copy to SMO
c. Pink (third) and Gold (fourth) copies accompany samples to the laboratory
d. Photocopy for sampler's file

1.3.4 FIELD QA/QC SUMMARY FORM

a. Original to QAMS, Region 9
b. Photocopy for sampler's files

2.0 CALLING IN SHIPPING INFORMATION TO THE ESAT RSCC COORDINATOR

2.1 Call the Environmental Services Assistance Team Regional Sample Control Center (ESAT RSCC) coordinator on a daily basis, even if no shipments were made. The ESAT RSCC coordinator may be reached at (415) 882-3069.

2.2 Try to stick to the sampling schedule. If this is not possible, let the ESAT RSCC coordinator know immediately so other arrangements can be made.

2.3 Notify the ESAT RSCC coordinator within 12 hours of sample shipments. Calling in sample shipments to the ESAT RSCC coordinator is MANDATORY. Notification of special shipments, such as Saturday deliveries, are detailed below.

2.3.1 Friday shipments for Saturday delivery must be called in by noon (12:00 pm) Friday. This is to enable the ESAT RSCC coordinator to pass the information on to SMO and, in turn, for SMO to contact the laboratories. Saturday pickup cannot be guaranteed if shipping information is received late. Samplers may not contact the laboratories directly. (Laboratories do not have to accept notification of delivery of samples from sources other than SMO.)

2.3.2 Laboratories may request advance notification of the arrival of certain types of samples, such as samples with very short holding times (e.g., Cr +6) that will be hand delivered to the laboratory. Required deadlines for notification of sample shipments in these special cases will be determined on a case by case basis. The ESAT RSCC coordinator will inform the samplers as to when notification of sample delivery is required (e.g., by noon on the day samples will be delivered). This is to facilitate the laboratory(ies) having personnel available to analyze the samples as soon as they arrive.

2.4 Provide the following information to the ESAT RSCC coordinator:

1. Case and/or SAS number
2. Name of Laboratory
3. Date of shipment
4. Carrier and airbill number
5. Number of samples shipped by matrix and analysis type
6. Number of coolers shipped
7. Information on completions, changes, delays, etc.

2.5 If you have an emergency and need to get information to a laboratory, your calls should be directed, in order of succession, to:

ESAT RSCC Coordinator - (415) 882-3069
EPA RSCC Task Monitor - (415) 744-1499
SMO Region 9 Coordinator (SAS) - (703) 519-1397
SMO Region 9 Coordinator (RAS) - (703) 519-1471

DO NOT call the laboratory(ies) directly under any circumstances.

3.0 ROUTINE ANALYTICAL SERVICES (RAS) TRAFFIC REPORT/CHAIN-OF-CUSTODY FORMS FOR ORGANIC AND INORGANIC ANALYSES

3.1 CASE DOCUMENTATION

Complete this form when collecting RAS or RAS+SAS samples. See Attachments 1 through 3 for examples.

Enter the RAS case number (and SAS case number if this is a RAS+SAS analysis) in the box(es) located in the upper right corner of the form. RAS case numbers have the format "xxxxx" (e.g., 18123) and SAS case numbers have the format "xxxx-Y-xx" (e.g., 6123-Y-01).

3.2 HEADER INFORMATION

3.2.1 Box 1 - PROJECT CODE/SITE INFORMATION

Enter the Project Code (i.e $F), Site Name, City, State, Site Spill ID. **(Note: the information entered here does not go through to the laboratory's copies.)**

If sampling is not under the Superfund program, enter the Account code (account to be billed), any Regional Information and the name of the program (e.g., RCRA) in the box titled "Non-Superfund program."

3.2.2 Box 2 - REGIONAL INFORMATION

Enter the Region number, the name of your sampling company, and your name and signature in the designated spaces.

3.2.3 Box 3 - TYPE OF ACTIVITY

Check the appropriate box(es) for the type of activity for this sampling event. See Appendix A for acronym definitions.

3.2.4 Box 4 - SHIPPING INFORMATION

Enter the date shipped, the carrier (e.g., Federal Express, Airbourne, etc.) and the air bill number in the appropriate spaces.

3.2.5 Box 5 - SHIP TO

Enter the laboratory name, full address and laboratory contact (e.g., Sample Custodian).

3.2.6 Box 6 - PRESERVATIVE

This box provides a list of commonly used preservatives. Enter the appropriate preservative in Column D. If you enter "5" on the Organic Traffic Report or "7" on the Inorganic Traffic Report indicating "Other", specify the preservative used at the bottom of the "Sample Documentation" area.

If you are using more than one type of preservative, you may either note the preservatives in the box specifically under the requested analyses (e.g., in the Cyanide box enter "2") or list them, separated by commas, in the same order as the checked sample analyses. (Alternatively, the analyses may be listed on separate lines.)

3.2.7 Box 7 - SAMPLE DESCRIPTION

This box provides a list of the description/matrices of the samples that are collected. Enter the appropriate description in Column A.

3.3 SAMPLE DOCUMENTATION

3.3.1 SAMPLE NUMBERS

Carefully transcribe the RAS sample numbers from the printed labels onto the Organic or Inorganic Traffic Report/Chain-of-Custody forms in the column labeled "CLP Sample Numbers."

RAS sample numbers have the following formats: YX123 for organic and MYX123 for inorganic samples. See Appendix B for examples.

3.3.2 Column A - SAMPLE DESCRIPTION

Enter the appropriate sample description code from Box 7.

Note: Item #6 "Oil" and Item #7 "Waste" are for SAS projects only. Do not ship oily samples or waste samples without making prior arrangements with the ESAT RSCC coordinator and SMO.

3.3.3 Column B - CONCENTRATION

Enter "L" for low and "M" for medium concentration samples. (Prior arrangements must have been made with the ESAT RSCC coordinator, SMO and the laboratories accepting the samples before shipping medium concentration samples. At this time, high concentration samples must be scheduled through the SAS system.)

NOTE: Medium concentration samples must be shipped in metal cans.

3.3.4 Column C - SAMPLE TYPE COMPOSITE/GRAB

Enter the type of sample you collected. A composite is a sample composed of more than one discrete sample. A grab is a discrete sample.

3.3.5 Column D - PRESERVATIVE USED

Enter the preservative used from Box 6.

3.3.6 Column E - RAS ANALYSIS

Check the analytical fractions requested for each sample, for example, VOAs, BNAs and Pesticides/PCBs are for low/medium concentration organics. Total metals and cyanide are for low/medium concentration inorganics.

NOTE: If dissolved metals are requested, a note must be added indicating that digestion is required. See Attachment 2 for an example.

3.3.7 Column F - REGIONAL SPECIFIC TRACKING NUMBERS OR TAG NUMBERS

Region 9 does not issue tracking numbers or tag numbers. Samplers may use this column for sampler specific tracking numbers or for "Special Instructions". If you choose to use this as "Special Instructions", be sure to note, at the

bottom of the "Sample Documentation" area, what the special handling is. The number and type of containers could be entered here. (e.g., 3-40 mL, 6-1L)

3.3.8 Column G - STATION LOCATION NUMBER

Enter the station location in the space provided.

3.3.9 Column H - MO/DAY/YEAR/TIME OF SAMPLE COLLECTION

Record the month, day, year and time (use military time, e.g., 1600 = 4:00 pm) of sample collection.

3.3.10 Column I - SAMPLER INITIALS

Enter your initials.

3.3.11 Column J - CORRESPONDING CLP ORGANIC/INORGANIC SAMPLE NUMBER

Enter the corresponding CLP sample number for organic or inorganic RAS analysis.

3.3.12 Column K - DESIGNATED FIELD QC

NOTE: This column is NOT to be used for the designated laboratory QC samples. **Information entered here is not reproduced onto the laboratories' copies.**

Enter the appropriate qualifier as listed below for "Blind" Field QC samples in this column. (NOTE: All samples must have a qualifier.)

Blind Field QC	Qualifier
Blind Blanks (field, etc.)	B
Blind Field Duplicates	D
Blind Field Spikes	S
Blind PE Samples	PE
All other field samples	--

"B" = These are blanks and include trip blanks (T), field blanks (F) and equipment blanks (E). Blanks may be further identified by the letter in parenthesis. For example, B(T) indicates that the sample is a trip blank.

"D" = These are field duplicates. Do not include samples designated as laboratory duplicates. The primary sample is identified with "--" and the duplicate is given "D" in column K. In addition, the station

locations should also identify the primary and duplicate samples. For example, MW-1 is the primary sample and MW-1B is the duplicate sample.

"S" = These are spiked field samples and are generated by field personnel

"PE" = These are performance evaluation samples. They are spiked samples but are not field samples. They are usually prepared by other than field personnel.

"--" = All other samples not designated as blind field QC samples are given this qualifier.

3.4 "SHIPMENT FOR CASE COMPLETE (Y/N)"

This should reflect the status of the samples scheduled to be shipped to a laboratory for a specific case. Only when ALL samples scheduled for shipment to a laboratory for a specific case have been shipped is the case complete.

3.5 "PAGE 1 OF ____"

Enter the number of Traffic Report/Chain-of-Custody Record form(s) enclosed in each cooler. The form(s) accompanying each cooler must list only those samples contained in that cooler.

3.6 "SAMPLE USED FOR SPIKE AND/OR DUPLICATE"

Enter the sample number of the sample designated for laboratory spike and/or duplicate analysis. This is also known as the Laboratory QC sample. This sample should be included in the first shipment to the laboratory and in the first shipment for each subsequent sample delivery group (SDG).

DO NOT enter samples designated as blind field duplicates in this block.

3.7 "ADDITIONAL SAMPLER SIGNATURES"

Record additional sampler signatures that are different from that in Box 2.

3.8 "CHAIN OF CUSTODY SEAL NUMBER"

Enter the Chain of Custody Seal Number used to seal the cooler, if applicable.

3.9 "SPLIT SAMPLES ACCEPTED/DECLINED"

The sampler should ask the site owner, potentially responsible party (PRP), etc. whether they want split samples taken. The split samples are either accepted or declined. Record the site owner's or PRP's signature and check the appropriate box.

3.10 Instructions summarizing CLP sample volumes, packaging and shipment reporting requirements are printed on the back of the Traffic Reports.

4.0 SPECIAL ANALYTICAL SERVICES (SAS) PACKING LIST/CHAIN-OF-CUSTODY FORMS

4.1 CASE DOCUMENTATION

Complete this form when collecting SAS samples. See Attachment 4 for an example.

Enter the SAS case number at the top right of the form. SAS case numbers have the format "xxxx-Y-xx" (e.g., 6123-Y-01).

4.2 HEADER INFORMATION

4.2.1 Box 1 - PROJECT CODE/SITE INFORMATION

Enter the Project Code (e.g., $F), Site Name, City, State, Site Spill ID. **(Note: the information entered here is not reproduced onto the laboratory's copies.)**

If sampling is not under the Superfund program, enter the Account code (account to be billed), any Regional Information and the name of the program (e.g., RCRA) in the box titled "Non-Superfund program."

4.2.2 Box 2 - REGIONAL INFORMATION

Enter the Region number, the name of your sampling company, and your name and signature in the designated spaces.

4.2.3 Box 3 - TYPE OF ACTIVITY

Check the appropriate box(es) for the type of activity for this sampling event. See Appendix A for acronym definitions.

4.2.4 Box 4 - SHIPPING INFORMATION

Enter the date shipped, the carrier (e.g., Federal Express, Airbourne, etc.) and the air bill number in the appropriate spaces.

4.2.5 Box 5 - SHIP TO

Enter the name of the laboratory contact (e.g., Sample Custodian), laboratory name, and full address.

4.2.6 Box 6 - SAMPLE DESCRIPTION

This box provides a list of the description/matrices of the samples that are collected. Enter the appropriate description in Column A.

4.2.7 Box 7 - PRESERVATIVE

This box provides a list of commonly used preservatives. Enter the appropriate preservative in Column C. If you enter "6" indicating "Other", specify the preservative used at the bottom of the "Sample Documentation" area.

4.3 SAMPLE DOCUMENTATION

4.3.1 SAMPLE NUMBERS

Carefully transcribe the SAS sample numbers from the printed sample labels onto the SAS/COC form in the space provided.

SAS sample numbers have the format SYxxxx (e.g., SY1234). See Appendix B for examples.

4.3.2 Column A - SAMPLE DESCRIPTION

Enter the appropriate sample description code from Box 6.

4.3.3 Column B - CONCENTRATION

Enter "L" for low concentration, "M" for medium concentration and "H" for high concentration.

NOTE: Medium and high concentration samples must be shipped in metal cans.

4.3.4 Column C - PRESERVATIVE USED

Enter the preservative used from Box 7.

If more than one type of preservative is used for a sample, separate the preservative reference numbers with commas. The sequence of the reference numbers must follow the sequence of the requested "SAS Analysis" parameters that are recorded in Column D.

4.3.5 Column D - ANALYSIS

Enter the analysis requested.

4.3.6 Column E - REGIONAL SPECIFIC TRACKING NUMBERS OR TAG NUMBERS

Region 9 does not issue tracking numbers or tag numbers. Samplers may use this column for sampler specific tracking numbers or for "Special Instructions". If you choose to use this as "Special Instructions", be sure to note, at the bottom of the "Sample Documentation" area, what the special handling is. The number and type of containers could be entered here (e.g., 6-1L).

4.3.7 Column F - STATION LOCATION NUMBER

Enter the station location in the space provided.

4.3.8 Column G - MO/DAY/YEAR/TIME OF SAMPLE COLLECTION

Record the month, day, year and time (use military time, e.g., 1600 = 4:00 pm) of sample collection.

4.3.9 Column H - SAMPLER INITIALS

Enter your initials.

4.3.10 Column I - DESIGNATED FIELD QC

NOTE: This column is NOT to be used for the designated laboratory QC samples. **Information entered here is not reproduced onto the laboratories' copies.**

Enter the appropriate qualifier for "Blind" Field QC samples in this column. (NOTE: All samples must have a qualifier.)

Blind Field QC	Qualifier
Blind Blanks (field, etc.)	B
Blind Field Duplicates	D
Blind Field Spikes	S
Blind PE Samples	PE
All other field samples	--

"B" - These are blanks and include trip blanks (T), field blanks (F) and equipment blanks (E). Blanks may be further identified by the letter in parenthesis. For example, B(T) indicates that the sample is a trip blank.

"D" = These are field duplicates. Do not include samples designated as laboratory duplicates. The primary sample is identified with "--" and the duplicate is given "D" in column K. In addition, the station locations should also identify the primary and duplicate samples. For example, MW-1 is the primary sample and MW-1B is the duplicate sample.

"S" = These are spiked field samples and are generated by field personnel

"PE" = These are performance evaluation samples. They are spiked samples, but are not field samples. They are usually prepared by other than field personnel.

"--" = All other samples not designated as blind field QC samples are given this qualifier.

4.4 "SHIPMENT FOR CASE COMPLETE (Y/N)"

This should reflect the status of the samples scheduled to be shipped to a laboratory for a specific case. Only when ALL samples scheduled for shipment to a laboratory for a specific case have been shipped is the case complete.

4.5 "PAGE 1 OF ___"

Enter the number of Packing List/Chain-of-Custody form(s) enclosed in each cooler. The form(s) accompanying each cooler must list only those samples contained in that cooler.

4.6 "SAMPLE USED FOR SPIKE AND/OR DUPLICATE"

Enter the sample number of the sample designated for laboratory spike and/or duplicate analysis. This is also known as the Laboratory QC sample. This sample should be included in the first shipment to the laboratory and in the first shipment for each subsequent sample delivery group (SDG).

DO NOT enter samples designated as blind field duplicates in this block.

4.7 "ADDITIONAL SAMPLER SIGNATURES"

Record additional sampler signatures that are different from that in Box 2.

4.8 "CHAIN OF CUSTODY SEAL NUMBER"

Enter the Chain of Custody Seal Number used to seal the coolers, if applicable.

4.9 "SPLIT SAMPLES ACCEPTED/DECLINED"

The sampler should ask the site owner, PRP, etc. whether they want split samples taken. The split samples are either accepted or declined. Record the site owner's or PRP's signature and check the appropriate box.

4.10 Instructions summarizing CLP sample volumes, packaging and shipment reporting requirements are printed on the back of the Traffic Reports.

5.0 SAMPLE BOTTLES

5.1 Sample bottles be labeled with the following information:

a. Case or SAS number
b. Date/Time of collection
c. Matrix/Concentration
d. Station Location
e. Sample number (from the pre-printed labels)
f. Analysis
g. Preservative

5.2 Pre-printed, self-adhesive labels are provided for RAS Organic, RAS Inorganic and SAS samples.

5.2.1 Transcribe the appropriate sample number onto the corresponding bottle label and/or affix the sample number label onto the bottle.

5.2.2 Destroy all unused labels or return them to the ESAT RSCC coordinator. DO NOT use them for future samplings. New sample numbers will be assigned.

6.0 FIELD QA/QC SUMMARY FORM

6.1 Complete one form per laboratory per matrix for each sampling event. For long term projects, complete a form(s) after each week of sampling. Complete the header portion even if no QA/QC samples were provided.

6.2 Complete all applicable entries. Please use the appropriate sample numbers for each laboratory. (e.g., for the laboratory performing RAS organics, use the CLP organic sample numbers, YX123, etc. For the laboratory performing SAS analyses, use the SAS sample numbers, SY0123, etc.) Please do not use station locations. If a laboratory is performing more than one type of analysis, list all applicable sample numbers. (For example, if the same laboratory is doing both RAS organics and SAS organics, list

both numbers separated by a backslash (e.g., YX123/SY0123) or list the two sample numbers on separate lines.) See Attachment 5 for an example.

6.3 This form is very important for validation purposes. The validators will compare the results of duplicates and assess the quality of blanks, if they know which samples they are. Failure to provide this information will delay the completion of the validation.

Appendix A

TYPE OF ACTIVITY

Check the box which describes the funding lead for this sampling event:

Funding Lead

SF = Superfund
PRP = Potentially Responsible Party
ST = State
FED = Federal

Check one or more boxes, as appropriate, which describe the task of this sampling event:

Pre-Remedial

PA = Preliminary Assessment
SSI = Screening Site Investigation
LSI = Listing Site Investigation

Remedial

RIFS = Remedial Investigation Feasibility Study
RD = Remedial Design
O&M = Operations and Maintenance
NPLD = National Priorities List

Removal

CLEM = Classic Emergency
REMA = Removal Assessment
REM = Removal
OIL = Oil Response
UST = Underground Storage Tank Response

Appendix B

CLP SAMPLE NUMBERS

Each sample is assigned a unique sample number. A "sample" is defined as follows:

- one matrix, e.g., water, soil/sediment, fish, etc.
- one station location
- one analytical program, e.g., RAS organics, RAS inorganics or a SAS analysis
- one laboratory

Sample numbers for RAS and SAS analyses:

- RAS Organic sample numbers consist of five alpha-numerics, always beginning with "Y"

  Example - YJ386

- RAS Inorganic sample numbers consist of six alpha-numerics, always beginning with "MY"

  Example - MYG528

- SAS sample numbers consist of six alpha-numerics, always beginning with "SY"

  Example - SY2905

Examples for assigning sample numbers:

- RAS Volatiles & RAS Pesticides/PCBs receive the <u>SAME SAMPLE NUMBER</u>, if the samples are:
  - the same matrix
  - part of the same analytical program, e.g., RAS organics
  - from the same station location
  - going to the same laboratory

- RAS Volatiles & RAS Pesticides/PCBs receive DIFFERENT SAMPLE NUMBERS, if the samples are:

  - the same matrix
  - part of the same analytical program, e.g., RAS organics
  - from the same station location
  - going to different laboratories

- RAS Volatiles & RAS Metals receive DIFFERENT SAMPLE NUMBERS, if the samples are:

  - the same matrix
  - part of different analytical programs, e.g., RAS organics & RAS inorganics
  - from the same station location
  - going to the same laboratory

- RAS Volatiles & SAS Herbicides receive DIFFERENT SAMPLE NUMBERS, if the samples are:

  - same the matrix
  - part of different analytical programs, e.g., RAS organics & SAS organics
  - from the same station location
  - going to the same laboratory

- SAS TDS & SAS Nitrate/Nitrite receive the SAME SAMPLE NUMBER, if the samples are:

  - the same matrix
  - part of the same analytical program, e.g., SAS inorganics
  - from the same station location
  - going to the same laboratory

EPA Organic Traffic Report & Chain of Custody Record

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

(For Organic CLP Analysis)

SAS No. (if applicable):

Case No.: 17235

1. Project Code: $F | Account Code:

2. Region No.: 9 | Sampling Co.: Ace

4. Date Shipped: 1-7-94 | Carrier: Fed. Express

Regional Information:

Sampler (Name): Gail Jones

Airbill Number: 091234567 8

Non-Superfund Program:

Sampler Signature: Gail Jones

5. Ship To: Alpha Lab
123 Pine Ave
NY, NY 10001

Site Name: Toxic Dump

3. Type of Activity: Lead / Pre-Remedial / Remedial / Removal

	Lead	Pre-Remedial	Remedial	Removal
SF	X		RIFS X	CLEM
PRP		PA	RD	REMA
ST		SSI	RA	REM
FED		LSI	O&M	OIL
			NPLD	UST

ATTN: John Doe

City, State: Smallville CA | Site Spill ID: 99

6. Preservative (Enter in Column D): 1. HCl; 2. HNO3; 3. $NaHSO_4$; 4. H_2SO_4; 5. Other (Specify); 6. Ice only; N. Not preserved

7. Sample Description (Enter in Column A): 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil/Sediment; 6. Oil (High only); 7. Waste (High only); 8. Other (Specify)

CLP Sample Numbers (from labels)	A Enter # from Box 7	B Conc. Low Med High	C Sample Type: Comp./ Grab	D Preservative from Box 6	E RAS Analysis: VOA	BNA	Pest/ PCB	High only ARO/ TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Inorg. Samp. No.	K Enter Appropriate Qualifier for Designated Field QC (B = Blank S = Spike D = Duplicate PE = Perform. Eval. — = Not a QC Sample)
YJ126	2	L	G			X				MW-1	1-6-94 0900	gf	MYG00X	—
YJ127	2	L	G			X				MW-2	1-6-94 1000	gf	MYG003	—
YJ128	2	L	G			X				MW-3	1-6-94 1100	gf	MYG005	—

Shipment for Case complete? (Y/N): N | Page 1 of 1 | Sample used for a spike and/or duplicate: YJ127 | Additional Sampler Signatures | Chain of Custody Seal Number

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Gail Jones	1-7-94 1600	091234567 8			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks Is custody seal intact? Y/N/none	

Split Samples: ☐ Accepted (Signature) ☐ Declined

EPA Form 9110-2 (Rev. 5-91) Replaces EPA Form (2075-7), previous edition which may be used

DISTRIBUTION: White - Lab Copy for Return to Region Yellow - Lab

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS

0243860

ATTACHMENT 1

1-90

EPA Inorganic Traffic Report & Chain of Custody Record

(For Inorganic CLP Analysis)

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

SAS No. (if applicable):

Case No.: 17235

1. Project Code: $F | Account Code:
Regional Information:
Non-Superfund Program:
Site Name: Toxic Dump
City, State: Smallville CA | Site Spill ID: 99

2. Region No.: 9 | Sampling Co.: Ace
Sampler (Name): Gail Jones
Sampler Signature: Gail Jones

3. Type of Activity (Lead / Pre-Remedial / Remedial / Removal)

	Lead	Pre-Remedial	Remedial	Removal
SF	X		RIFS X	CLEM
PRP		PA	RD	REMA
ST		SSI	RA	REM
FED		LSI	O&M	OIL
			NPLD	UST

4. Date Shipped: 1-7-94 | Carrier: Fed. Express
Airbill Number: 091234569 9

5. Ship To: Beta Labs, Inc.
465 Maple Ave.
Atlanta, GA 04507
ATTN: Mary Smith

6. Preservative (Enter In Column D)
1. HCl
2. HNO3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (Specify)
N. Not preserved

7. Sample Description (Enter In Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (Specify)

CLP Sample Numbers (from labels)	A Enter # from Box 7	B Conc. Low Med High	C Sample Type: Comp / Grab	D Preservative from Box 6	E - RAS Analysis: Metals Total	Metals Dissolved	Metals Cyanide	Low Conc only Nitrate/ Nitrite	Low Conc only Fluoride	High only pH	High only Conductivity	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Org. Samp. No.	K Enter Appropriate Qualifier for Designated Field QC (B = Blank S = Spike D = Duplicate PE = Perform. Eval. — = Not a QC Sample)
MYG001	2	L	G	2	X		X						MW-1	1-6-94 0900	JB	YJ126	—
MYG002	2	L	G	2		X						A	MW-1	1-6-94 0915	JB	YJ126	—
MYG003	2	L	G	2	X		X						MW-2	1-6-94 1000	JB	YJ127	—
MYG004	2	L	G	2		X						A	MW-2	1-6-94 1015	JB	YJ127	—

A = Field Filtered, 0.45 micron
Digestion required for all dissolved samples

Shipment for Case complete? (Y/N): N | Page 1 of 1

Sample used for a spike and/or duplicate: MYG003 + MYG004

Additional Sampler Signatures: John Brown

Chain of Custody Seal Number:

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Gail Jones	1-7-94 1600	091234569 9			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks Is custody seal intact? Y/N/none	

Split Samples ☐ Accepted (Signature)
☐ Declined

EPA Form 9110-1 (Rev. 5-91) Replaces EPA Form (2075-6), previous edition which may be used

DISTRIBUTION:

ATTACHMENT 2

Organic Traffic Report & Chain of Custody Record

(For Organic CLP Analysis)

EPA — United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

SAS No. (if applicable):

Case No.: R94S17

1. Project Code: $F
Account Code:
Regional Information:
Non-Superfund Program:
Site Name: Toxic Dump
City, State: Smallville CA
Site Spill ID: 99

2. Region No.: 9
Sampling Co.: ACE
Sampler (Name): Gail Jones
Sampler Signature: Gail Jones

3. Type of Activity: Lead / Pre-Remedial / Remedial / Removal
SF [X] PA [ ] RIFS [X] CLEM [ ]
PRP [ ] SSI [ ] RD [ ] REMA [ ]
ST [ ] LSI [ ] RA [ ] REM [ ]
FED [ ] O&M [ ] OIL [ ]
NPLD [ ] UST [ ]

4. Date Shipped: 1-7-94
Carrier: Fed. Express
Airbill Number: 091234568O

5. Ship To: USEPA Reg. 9 Lab.
1301 S. 46th St. Bldg 201
Richmond, CA 94804
ATTN: Nancy Wilson

6. Preservative (Enter in Column D)
1. HCl
2. HNO3
3. $NaHSO_4$
4. H_2SO_4
5. Other (Specify)
6. Ice only
N. Not preserved

7. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (Specify)

CLP Sample Numbers (from labels)	A Enter # from Box 7	B Conc. Low Med High	C Sample Type: Comp./ Grab	D Preservative from Box 6	E RAS Analysis: VOA	BNA	Pest/ PCB	High only ARO/ TOX	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Inorg. Samp. No.	K Enter Appropriate Qualifier for Designated Field QC (B = Blank S = Spike D = Duplicate PE = Perform. Eval. — = Not a QC Sample)
YJ123	5	L	G	6	X					SB-1	1-6-94 1300	gf	—	—
YJ124	5	L	G	6	X					SB-2	1-6-94 1400	gf	—	D(YJ124)
YJ125	5	L	G	6	X					SB-3	1-6-94 1500	gf	—	

Shipment for Case complete? (Y) (N)
Page 1 of 1
Sample used for a spike and/or duplicate: YJ123
Additional Sampler Signatures:
Chain of Custody Seal Number:

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Gail Jones	1-7-94 1600	091234568O			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks: Is custody seal intact? Y/N/none	

Split Samples [ ] Accepted (Signature)
[ ] Declined

EPA Form 9110-2 (Rev. 5-91) Replaces EPA Form (2075-7), previous edition which may be used

ATTACHMENT 3

EPA — Special Analytical Services Packing List/Chain of Custody

United States Environmental Protection Agency
Contract Laboratory Program

SAS No.: 6123-Y-01
Case No.:

1. Project Code	SF
Account Code	
2. Region No.	9
Sampling Co.	ACE
4. Date Shipped	1-7-94
Carrier	Fed. Express
Regional Information	
Sampler (Name)	Gail Jones
Airbill Number	091234567 0
Non-Superfund Program	
Sampler Signature	Gail Jones
5. Ship To	Omega Testing Co 101 Main St. NY, NY 10002 ATTN: Bob Smith
Site Name	Toxic Dump
City, State	Smallville CA
Site Spill ID	99

3. Purpose*
Lead: [X] SF [ ] PRP [ ] ST [ ] FED
Early Action: [ ] CLEM [ ] PA [ ] REM
[ ] SI [ ] ESI [X] RI [ ] OIL [ ] UST
Long-Term Action: [X] FS [ ] RD [ ] RA [ ] O&M [ ] NPLD

6. Matrix (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Field QC
5. Soil/Sediment
6. Oil
7. Waste
8. Other (Specify in Column A)

7. Preservative (Enter in Column D)
1. HCl
2. HNO_3
3. $NAHSO_4$
4. H_2SO_4
5. NAOH
6. Ice only
7. Other (Specify in Column D)
N Not preserved

Sample Numbers (from labels)	A Matrix (from Box 6) Other:	B Conc.: Low Med High	C Sample Type Comp / Grab	D Preservative (from Box 7) Other:	E Analysis	F Regional Specific Tracking Number or Tag Numbers	G Station Location Identifier	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Field QC Qualifier (B = Blank, S = Spike, D = Duplicate, R = Resample, PE = Perform. Eval., - = Not a QC Sample)
SY0001	2	L	G		A		MW-1	1-7-94 0800	gj	-
SY0002	2	L	G		A		MW-2	1-7-94 0830	gj	-
SY0003	2	L	G	6	B		MW-3	1-7-94 0900	gj	-
SY0004	2	L	G	6	A		MW-4	1-7-94 0930	gj	B (F)

A = Herbicides + Carbamates
B = Herbicides only

Shipment for SAS Complete? (Y/N)	Page	Sample(s) to be Used for Laboratory QC	Additional Sampler Signatures	Chain of Custody Seal Number(s)
Y	1 of 1	SY0002		

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Gail Jones	1-7-94 1600	091234567 0			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks Is custody seal intact? Y/N/none	

DISTRIBUTION: White - Region Copy; Yellow - SMO Copy; Gold - Lab Copy for Return to Region; Pink - Lab Copy for Return to SMO

EPA Form 9110-3

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS
*SEE REVERSE FOR PURPOSE CODE DEFINITIONS

38217

ATTACHMENT 4

ATTACHMENT 5

FIELD QA/QC SUMMARY FORM

Instructions: Complete one form per laboratory and per matrix for each sampling event

Date: 1-10-94
Sampler: Gail Jones
Office: ACE
Phone: (415) 456-7890

Site: Toxic Dump
Case/SAS #: 17235
Laboratory: Beta Labs, Inc

Matrix: (check one) X Groundwater ___Surface Water ___Surface Soil ___Subsurface Soil ___Air ___Other

I. BLANKS

Sample #	Type (circle one)	Date Collected
MVG 021	(Equip) / Field / Travel	1-9-94
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	
	Equip / Field / Travel	

II. BACKGROUND SAMPLES

Sample #	Date Collected

III. LAB QC SAMPLES

Sample #	Date Collected
MVG 003	1-6-94
MVG 004	1-6-94

IV. DUPLICATES

Sample #	Matches Sample #	Date Collected	Type (circle one)
MVG 015	MVG 016	1-9-94	a / (b) / c / d
			a / b / c / d
			a / b / c / d
			a / b / c / d
			a / b / c / d
			a / b / c / d

a= composite spl.
b= consecutive
c= colocated
d= consecutive soil sleeves

V. Checklist of Field Problems Encountered

X None
___Pumping Equipment Problems
___Sample Filtering Problems
___Less Than Required Sample Volume
___Low Flow/Recharge Rates
___Preservation Problems
___Samples Not Shipped in 24 hrs.
___Federal Express Delay
___Other

Sample # / Date(s) of Occurrence / Comments